FRANTZ INTRODUCES BEER COOLING UNITS

(*Concluded from Page 1, Column 5*)

Each of the two beverage coils are 50 ft. long, and are made of 8-oz. block tin. The faucets are finished in chromium.

Designed for heavy duty capacity is the new Frantz model 6-BB, which is 30¾ in. wide, 34½ in. deep, and 42½ in. high. Its top dimensions are 21x34½ in.

Finished in white porcelain on steel, the cabinet of this model has a removable top with a nickel silver bar drain and perforated splash screen. Insulation used is 2-in. Armstrong corkboard.

Sixteen-oz. copper is used as the interior lining, and a brass stand pipe is located within the cabinet. This unit has two beer faucets and one water faucet. Each of the beverage coils is 75 ft. long, and is made of 8-oz. block tin.

Bars in Any Length

The Frantz company is building bars in any length desired. Standard bars are 24 in. wide and 42½ in. high. With the exception of the hardwood top, the bars are all metal. Front and sides are of steel finished in porcelain, paneled with reinforced German silver pylasters.

Also in production is a small, deluxe model bar which is finished in walnut and proofed against alcohol with Kiel Lac. This bar is 16 in. wide, 42 in. high, 5 ft. long, and weighs 155 lbs.

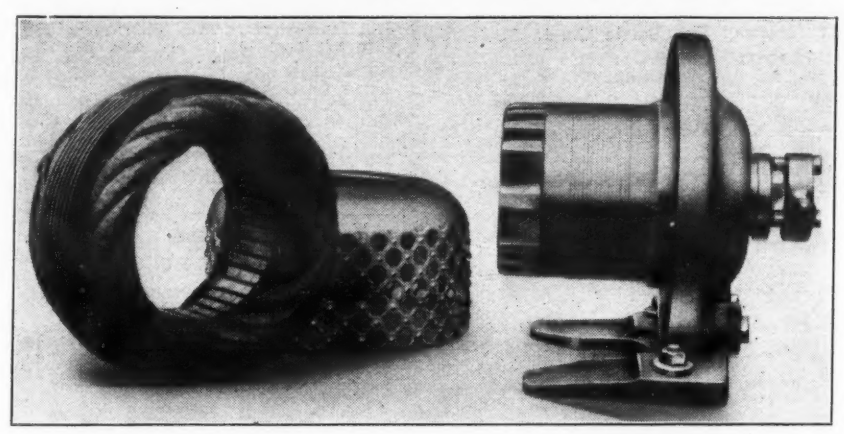
The bar is made of hardwood with brass rails and brackets. When the rail is removed, the bar may be folded for moving purposes.

Frantz is also manufacturing a washboard and rinse tank similar in design and appearance to the company's standard bar equipment. Available in any length, this unit is 18 in. wide, and 28 in. high.

Drain board, edges, and back are covered with German silver, and the rinse tank—9 in. deep and 13½ in. in diameter—is made of the same material. Front, ends, and legs of the unit are finished in white porcelain.

Demonstrate New Compressor

Abbe Audiffren, inventor of one of the first hermetically sealed systems, shows a keen interest in Carlos Zorzi's new compressor (described below). This picture was taken in Milan, Italy.



New Zorzi household refrigeration compressor, dismantled. Story below.

Zorzi Develops Sealed Compressor

NEW YORK CITY—Carlos Zorzi, an Italian engineer and inventor of one of the first vacuum feed systems (now used by Stewart-Warner) and several electrochemical processes, is showing American manufacturers a new type of sealed compressor which employs the action of an external rotating magnetic field to propel the rotor, according to V. Annoni who is cooperating with Mr. Zorzi in promotion of the machine.

The compressor consists of a cylinder and piston both rotating together with the rotor of the motor, the assembly being held together by a non-rotating centrally fixed shaft.

The compressor is driven entirely by the action of the external magnetic field built up by the stator winding on the outside of the compressor. The rotor is immersed in the refrigerating gas inside the machine.

The external stator is easily dismounted, Mr. Annoni states. The motor has no relays, commutator, or brushes, and no special thermostatic or overheating protection is needed, the designer claims, because the motor is designed to eliminate overheating.

Another feature of the machine is the fact that it does not give the refrigerating medium any of the heat developed in the motor winding because the winding is external.

A compressor sized for a 7-cu. ft. cabinet is 8¾ by 9 in., and absorbs between 150 and 200 watts. The designers figure that the unit will consume about 300 watts of current per cubic foot of circulated gas at a pressure of 60 lbs. per sq. in. and zero suction pressure. Heating of the motor working continuously does not exceed 110° F. over room temperature.

First industrial license on the new Zorzi compressor was given to the Societa Eng. E. Bazzi & Co., the Italian Audiffren organization of Milan, Italy.

TAGLIABUE BUILDS 2 PRESSURE CONTROLS

BROOKLYN—Designed for use in household electric refrigerators, two new Tag Snapon automatic temperature and pressure controls with overload relays are being introduced to the industry by the C. J. Tagliabue Mfg. Co. of this city.

Designated as types R-8 and R-9, the two devices are of identical design except in switch construction, the former having a toggle switch, the latter a push-pull knob, according to officials of the company.

The controls are for use with motors up to ⅓ hp. a.c., 110 and 220 volts, and up to ¼ hp. d.c., 115 and 230 volts, without relay.

Control mechanism is completely housed in a small black Bakelite case, and the steel contact lever arm and all other internal parts subject to rust are cadmium plated.

The push plug is located at the back of this case, as is the overload relay coil. Access to this coil is gained by removing a small cover plate held in place by a screw.

Defrosting by the new Tag control is semi-automatic, its manufacturer explains. When the pointer on the adjusting knob is turned to "defrost," the differential setting of the control is raised, thus enabling the evaporator coils to defrost, while the unit continues to operate at a temperature sufficient for safe food preservation.

After defrosting of the coils has been accomplished, it is necessary to turn the indicator back to the "normal" or "colder" position to obtain lower temperatures.

The new temperature control, in either model R-8 or R-9, has a total range of 40° F., a minimum differential of 6°, and a maximum differential of 25° F. This control is available with tubing up to 10 ft. in length, with a nickel-white copper bulb.

The new pressure model, either R-8 or R-9, has a total range of 40 lbs. (or its equivalent in vacuum and pressure), a minimum differential of 6 lbs. pressure, and a maximum differential of 25 lbs. pressure.

Another device just introduced by this manufacturer is a new water circulating valve for use on water-cooled commercial refrigerating machines. The valve is being made in both high- and low-pressure models.

The low-pressure model is designed to move from shut to wide open by an increase of 15 to 20 lbs. in refrigerant pressure, while the high-pressure model requires approximately 30 lbs. increase to open completely.

Bellows in the new valve are protected from contact with water by a special rubber diaphragm, and will withstand 150 lbs. of pressure in the low-pressure model and 200 lbs. in the high-pressure model, Tagliabue engineers state.

FRIGIDAIRE STEPS UP FACTORY SCHEDULE

(*Concluded from Page 1, Column 5*)

tooling program at our Moraine plant has been fully justified."

Employment has been increased steadily since Feb. 1, when production of the 1933 line of products was begun, Mr. Biechler declares.

Frigidaire's four convention crews, headed by F. R. Pierce, sales manager, H. F. Lehman, commercial sales manager, J. J. Nance, manager, sales planning division, and George S. Jones, Jr., manager public utilities division, rolled into Dayton late last week after visiting the 36 key cities of the country, from coast to coast and border to gulf.

Three of nature's eccentricities—earthquakes, floods, and blizzards—struck during the convention period.

Mr. Jones' party arrived in Los Angeles a few hours after the devastating quake, yet had a record turnout for the convention meeting. Mr. Lehman's crew followed the Ohio, Wabash, and Mississippi valley floods across Indiana and into Cincinnati, but had record attendance.

Mr. Nance and his group battled two typical northwesters at St. Paul-Minneapolis and Milwaukee, respectively, and still had capacity audiences, some members of which had driven 300 to 400 miles from northern Minnesota and the eastern Dakotas to obtain the 1933 selling plans and view the new products.

Reports of Meetings

OMAHA—Frigidaire Corp.'s 1933 line was presented to 250 Frigidaire dealers and salesmen at a meeting held here recently. An all-day program, staged by J. J. Nance, Frigidaire's sales planning manager, and a factory crew, was held in the ballroom of the Hotel Fontenelle. District Manager P. K. Abry was in charge of the meeting.

281 Meet in Los Angeles

LOS ANGELES—Frigidaire dealers and salesmen—281 of them—met here on March 15 to see the 1933 Frigidaire household line presented by a factory crew headed by George S. Jones, Jr., Frigidaire public utility sales manager. T. J. McIntire, Los Angeles Frigidaire district manager conducted the meeting, which was held in the Biltmore hotel.

Baltimore Convention

BALTIMORE—Two hundred thirty Frigidaire dealers and salesmen from the Baltimore-Washington, D. C., district attended the Frigidaire spring convention held at the Southern hotel here recently. Frigidaire's 1933 plans and products were presented by F. R. Pierce, Frigidaire's sales manager, and factory crew members. District Manager E. B. Dorsee presided.

199 Dealers at Iowa Meeting

SIOUX CITY, Iowa—Frigidaire factory men presented the 1933 line of products to 199 Frigidaire dealers and salesmen at the K. of C. hall two weeks ago. J. J. Nance, manager of the Frigidaire sales planning division, and members of a factory crew presented the program. D. K. Baxter, president of D. K. Baxter, Inc., Frigidaire distributor here, conducted the meeting.

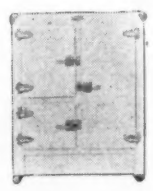
200 Meet in Miami

MIAMI, Fla.—With 200 dealers and salesmen from the Miami and Tampa Frigidaire distributorships present, H. F. Lehman, Frigidaire commercial sales manager, and a factory crew presented the 1933 Frigidaire household line and sales plans at a one-day meeting here two weeks ago. F. H. McDonald, Miami distributor, and W. M. Byars, Tampa distributor, were in charge of the meeting.

A 4-Star Steel Sheet *for* Refrigerators, Cabinets, Ice Boxes

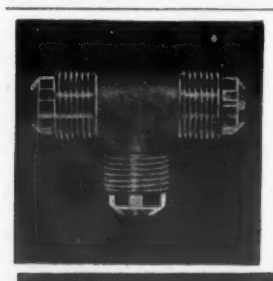
A quartet always has four people and steel sheets that are most suitable for high grade cabinet manufacture must have at least four qualities—workability, surface, rust-resistance and a peel proof coating. Superior Galvannealed is recognized by leading cabinet makers as an outstanding contribution to the cabinet industry. It is especially recommended for use where corrosion producing elements are present.

The Superior Sheet Steel Co.
Canton, Ohio
Division of Continental Steel Corporation

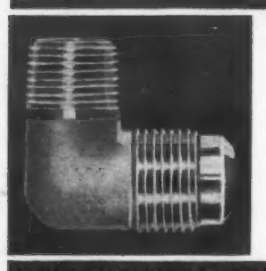


- Superior Galvannealed is a special analysis steel sheet.
- Zinc coated by a patented heat-treating process that *bonds* the coating to the base metal.
- The coating will not chip, flake or peel under the most difficult forming operations.
- The surface will take and retain any finish—paint, lacquer or enamel — without preparatory treatment.

Superior Galvannealed PATENTED PROCESS



BUILT RIGHT—TO STAY TIGHT



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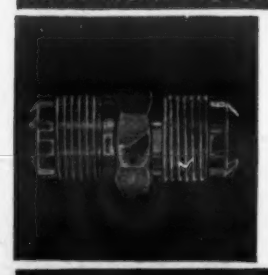

BUILT RIGHT—TO STAY TIGHT

STAMINA

It takes a lot of stamina to stand the pressure nowadays . . . Shocks of one kind or another multiply and the stresses and strains resulting produce the finest test of stamina.

Ability to stand the constant pressure of refrigerants is inbuilt in Commonwealth Brass Fittings. Made from hot forgings or extruded rod, these fittings are Seepage Proof. They are Built Right To Stay Tight.

Commonwealth Fittings "can take it" and have proved their stamina for upwards of 20 years. In addition to their toughness and freedom from porosity the buyer of these fittings secures perfect fitting pieces, protected from accident from the plant to the job.

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THE NEWSPAPER OF THE INDUSTRY

ELECTRIC REFRIGERATION NEWS

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SERVEL ADOPTS NEW POLICIES OF DISTRIBUTION

All New Distributors Required to Sell At Retail

EVANSVILLE, Ind.—Inaugurating what it terms a "new deal" in its distribution set-up and policies, Servel Sales, Inc., here has adopted a plan whereby it will require all distributors franchised from now on to do retail selling, at least in their own immediate localities.

This does not mean that established Servel distributorships doing only a wholesale business will be abolished, says W. Paul Jones, advertising and sales promotion manager, in correcting a statement to that effect made several days ago in another medium.

Status of present wholesale distributors who are doing a satisfactory business will remain unchanged, he explains. And new distributorships, while required to do retail business in their own cities, will be privileged to

(*Concluded on Page 4, Column 4*)

FRIGIDAIRE DEVELOPS NEW HOME BEER COOLER

DAYTON—Coincident with the announcement that C. E. Quigley will manage the beer-cooling equipment division of Frigidaire Corp. and that the company has designed a new semi-portable beer cooler for homes and small restaurants, details were released last week on Frigidaire models TT-12CC and TT-4C beer coolers.

According to H. W. Newell, vice president in charge of sales, Frigidaire's beer-cooling equipment has ca-

(*Concluded on Page 8, Column 1*)

Activity at Frigidaire

This picture shows the day shift going to work at Frigidaire's plant 2 in Dayton at 6:45 in the morning.

Specifications of 319 Machines Given In Food News

Specifications of 319 models of commercial refrigerating machine made by 25 leading manufacturers of commercial refrigeration units are printed in the April issue of REFRIGERATED FOOD NEWS, monthly publication which covers editorially the application of refrigeration to the production, transportation, and retailing of food products.

The following makes are represented in the specifications tabulation: American Ace, Audiffren, Baker, Brunner, Copeland, Diceler, Excelsior, Frick, Frigidaire, Froskist, General

(*Concluded on Page 20, Column 1*)

COPELAND ANNOUNCES LOW-PRICED MODELS

MT. CLEMENS, Mich.—A new supplementary line of low-priced electric refrigerators is announced by C. W. Hadden, sales manager, Copeland Products, Inc. Prices start at $96 f.o.b. factory, including tax and installation. All models are covered by a one-year guarantee on both cabinets and refrigerating systems.

The new line of cabinets will include four, five, and six cubic foot models, and will be made by the Truscon Steel Corp. They will be finished with porcelain interiors and Truscon special lacquer exteriors. The cabinet design will be modernistic streamline.

(*Concluded on Page 4, Column 1*)

Frick Enters Field With Methyl Machines

WAYNESBORO, Pa.—Entrance into the small machine field of Frick Co., maker of industrial and ice-making machinery, was announced last week with the introduction of 13 models of methyl chloride condensing units, ranging from ¼ to 3 hp. The new machines will be finished in maroon enamel, conforming to the color scheme of the larger Frick equipment.

The new condensing units have belt-driven reciprocating compressors, with one, two, or three cylinders, and either air- or water-cooled condensers. Wagner motors, Tag controls, and Penn water valves are standard.

Ice melting capacities of the new machines range from 112.8 to 2844 lbs. per 24 hours (A.S.R.E.) using methyl chloride. When required, the machines are readily adaptable for use with Freon, Frick engineers declare. Sale of the new line will be handled by branch offices and distributors.

ICE-O-MATIC CUTS PRICE TO $99.50 UNTIL MAY 8

BLOOMINGTON, Ill.—New low prices starting at $99.50 (installed) have been placed on the entire line of Ice-O-Matic electric refrigerators by the Williams Oil-O-Matic Heating Corp. here.

The manufacturer is guaranteeing these prices, however, only until May 8, according to S. C. Bell, sales manager of the refrigeration division.

Prices recommended to distributors by the factory are as follows:

Model Y-4, with a 4-cu. ft. net capacity, $99.50; model Y-5, 5.3 cu. ft. in capacity, $139.50; model Y-6, having a 6.4-cu. ft. storage space, $156.50; model L-41, with a capacity of 4 cu. ft., $139; model L-53, 5.3 cu. ft. in capacity, $169; model L-64, having storage space of 6.4 cu. ft., $195.

Model L-53-T, with a 5.3-cu. ft. net

(*Concluded on Page 4, Column 5*)

G.E. INTRODUCING HOTPOINT MODEL TO WHOLESALERS

New Refrigerators to Be Sold by Supply Houses

DETROIT—Local branch of the General Electric Supply Corp. has just received its first model of the new Hotpoint electric refrigerators which are being made by the refrigeration department of the General Electric Co. in Cleveland for distribution through the wholesale supply company, according to local officials.

Hotpoint model received in Detroit is apparently identical to the 1933 G. E. Junior refrigerator, now manufactured in three models for distribution through G. E. specialty distributorships and dealerships, except for the trade name "Hotpoint" which appears on a chromium plate above the switch and cold control panel.

Although local G. E. men have as yet received scant information as to sales plans for the new product, they state that installed prices in this zone

(*Concluded on Page 4, Column 4*)

TWO-DOOR MODEL ADDED BY DOMESTIC INDUSTRIES

MANSFIELD, Ohio—A new two-door refrigerator has been added to the Richland line of electric refrigerators manufactured by Domestic Industries, Inc., according to W. C. A. Bickham, general sales manager of the company.

The Buckeye models (with top-mounted units) are being continued this year with no important changes in design, while the Richland line

(*Concluded on Page 4, Column 3*)

NEW AIR-CONDITIONING MODELS DESIGNED FOR 1933

NEW ILG CONDITIONER IS SELF-CONTAINED

CHICAGO—Engineers of the Ilg Electric Ventilating Co. have designed a completely self-contained electrically refrigerated room cooler which is being introduced through Ilg sales offices under the name of the Ilg-Spot-Kooler, according to J. M. Frank, president of the company. A number of the new coolers have already been ordered for installation some time this month in lawyers' offices, private offices, and homes, he states.

The new cabinet contains a twin-cylinder Ilg compressor driven by an Ilg motor, a double cooling coil, an Ilg self-cooled motor propeller fan, an Ilg thermostat, and a new type of ejector for removing the water of condensation. The outfit has a cooling capacity of .55 ton, and is installed by plugging in on a light circuit and making a connection to a water faucet, Mr. Frank reports.

A novel feature of the new cabinet is its adjustable deflector by which it is claimed that the user can direct a stream of cold air in any direction without getting a draft.

SIROCCO ICE PRE-COOLERS DESIGNED FOR RAILROADS

DETROIT—American Blower Corp. has just announced new ice-cooled types of pre-coolers for railroad cars, designed to cool Pullman cars in warm weather service.

The pre-cooler is intended for terminal use, being mounted on a truck which is rolled up beside the car to be cooled.

Air from the car is first drawn over cakes of ice and then is passed through a spray chamber where chilled water obtained from the melting ice is used for additional cooling as well as cleaning. It is then forced through eliminators where entrained moisture is removed, and is finally returned to the car by a Sirocco fan.

(*Concluded on Page 12, Column 3*)

G.E. Bringing Out Refrigerated Conditioner

NEW YORK CITY—General Electric Co. and Campbell Metal Window Co., a subsidiary of American Radiator & Standard Sanitary Corp., have just announced the joint development of a new air-conditioning unit for offices, homes, shops, etc.

The conditioner is designed to circulate, deaden sound, and filter air in all seasons, cool and dehumidify in summer, and heat and humidify in winter. It will be distributed through the air-conditioning department of General Electric, and through selected trade channels of the Campbell Metal Window Co.

General Electric motors, refrigerating machines, and automatic controls are to be used, with American Radiator cabinets and heating surfaces, and Maxim silencing devices by Campbell Metal Window Co.

MOTORS METAL TO SELL BRIGHT COMFORT COOLER

DETROIT—The Komforte Koolaire portable ice room cooler which was designed by the George B. Bright Co., consulting engineers here, is now being manufactured and supplied to dealers by the Motors Metal Mfg. Co. of Detroit. Komforte Koolaire Co., Inc., of Milwaukee is also serving as a wholesale outlet for the cooler.

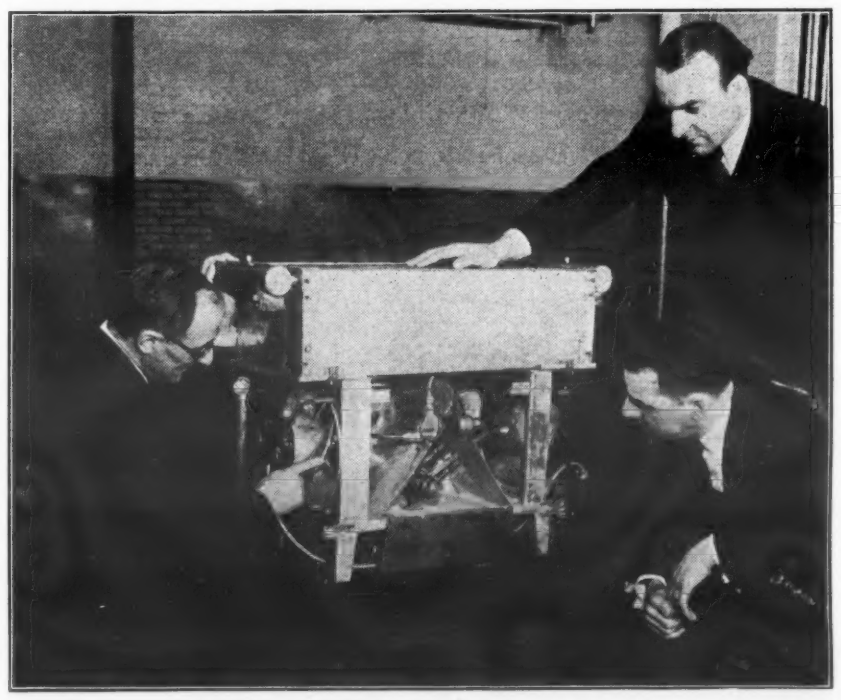
New retail prices have been placed on the units, and are $135 for the cooler finished in walnut, and $130 for the unit finished in green enamel. Prices are f.o.b. Detroit.

The Komforte Koolaire unit is 20 in. wide, 39 in. long, and 46 in. high. According to Mr. Bright, who supervised its design, it will cool a space of approximately 3,000 cu. ft., and consumes a maximum of 30 lbs. of ice per hr.

In general design, this cooler is two metal boxes, the smaller, inside box being the receptacle for ice and water.

(*Concluded on Page 12, Column 4*)

Inspect New Air Conditioner



R. E. Hellmund (left), Westinghouse chief electrical engineer, explains engineering features of the new air-conditioning unit to two field men.

• • •

New Westinghouse Air Conditioners Finished In Micarta; To Use F-12

EAST PITTSBURGH, Pa.—Following the sale of room coolers in a restricted territory last year, Westinghouse Electric & Mfg. Co. is now introducing room conditioners in one-ton capacity for visible mounting, and one-, two-, four-, and six-ton conditioners for concealed or suspended installation, according to J. W. Speer, manager of the commercial air-conditioning division.

The equipment will provide for cooling, dehumidifying, heating, humidification, cleaning, and circulation of air. Furnished with the air conditioners will be Westinghouse commercial refrigerating machines and controls.

The small one-ton cabinets will be manufactured in three types: low floor type to replace radiators mounted under windows, high floor type to be mounted in other locations, and a suspended type for ceiling or wall mounting, Mr. Speer announces.

Part of the new equipment is to be manufactured in East Springfield, Mass., the remainder here in East Pittsburgh. The Westinghouse company is also building air-conditioning

(*Concluded on Page 12, Column 1*)

FRIGIDAIRE TO START CAMPAIGN SATURDAY

DAYTON—Air conditioning selling activity by districts and dealers for Frigidaire Corp., subsidiary of General Motors, will get under way on a national scale on Saturday, April 15, J. C. Chambers, manager of the air-conditioning division, announces.

Selling has been going on since Feb. 1 in the major centers of population, he said, with the result a substantial amount of business already has been closed, and many additional prospects secured.

The early season sales have been confined almost exclusively to commercial establishments which are buying air conditioners to increase business, according to Mr. Chambers, but in the South domestic sales are beginning to come in.

"Every branch and every distributor, and all of our larger dealers already are set up with air-conditioning salesmen. The diversity of our equipment enables us to meet air-conditioning requirements for either commercial or domestic establishments," Mr. Chambers declares.

Selling pieces developed to assist salesmen in contacting air-conditioning prospects include a pocket-size manual containing a complete discussion of air conditioning from prehistoric times to the present. The manual

(*Concluded on Page 12, Column 5*)

MUELLER CLIMATOR SYSTEM TO USE FRIGIDAIRE

MILWAUKEE—Frigidaire air-cooling and dehumidifying equipment has been adopted for use with the Mueller Climator domestic air-conditioning systems, manufactured by the L. J. Mueller Furnace Co. of this city. Sale of the complete systems will be handled by the Mueller company, while delivery, installation, and service of the Frigidaire equipment will be handled by the Frigidaire organization.

BY GEORGE F. TAUBENECK - - -

Air Conditioning

"What," TED QUINN, vice president of the General Electric Co., rhetorically asked us in New York recently, "is air conditioning? Is it a fan, a humidifier, or what? Does anybody know? It's all very vague at present."

And that, we think pretty well sums up the air-conditioning situation today. It still is in a formative stage. Perhaps it might be even better to call it the "argumentative stage."

That some very stout-minded men believe in its great future, however, cannot be gainsaid. Many of them are gambling on it.

For instance, L. G. LINDSAY, formerly vice president and sales manager for Mayflower, has resigned to go into the air-conditioning business for himself. And the other day we heard about a renewed combination now working on air-conditioning apparatus at the Baldwin-Southwark Corp. in Philadelphia.

The combination consists of G. S. McKEE, formerly vice president and works manager for the D. A. Ebinger Mfg. Co., and ALFRED WEILAND, formerly production manager of RCA-Victor at Camden, N. J., and later production manager of Grigsby-Grunow. Messrs. Weiland and McKee worked together at the latter plant.

Toiling with the De La Vergne refrigeration division of Baldwin-Southwark (of which Mr. Weiland is now assistant general manager), these two men are getting a room cooler ready for production. It will be of the hermetic, self-contained type, and will humidify, dehumidfy, and circulate the air.

Latest advances in the air-conditioning industry are recorded in this issue of the NEWS.

* * *

Williams, Churchill

At Servel headquarters in New York we found E. T. WILLIAMS and DR. J. B. CHURCHILL. Wherever these two old cronies—both are white-haired and polished in the old-school fashion—are to be found, you can wager your back pay that there's a refrigeration code in the offing.

Mr. Williams, who is consulting engineer for Servel, Inc., built one of the first household electric refrigerators on record, and is still building and experimenting.

Dr. Churchill was formerly with Icemaster, and is a consulting chemist of considerable authority.

First time we encountered this pair of code experts was in Chicago in 1929, when they were, with FREMONT WILSON, chief defenders of the methyl chloride faith in that memorable war over refrigerants.

Today they are fighting the unrestricted use of F-12 in New York City.

* * *

Grunow Advertising

Speaking of refrigerants reminds us of BILL GRUNOW and the scare he threw into refrigeration manufacturers last fall.

In the spring of 1930 when Bill was putting up Majestic's model plant, he frightened the daylights out of the industry by allowing the rumor to spread that he would put a $100 refrigerator on the market.

Today $100-and-less refrigerators are commonplace. But three years ago even the thought of such a price was preposterous and ghastly. Bill eventually brought out a machine which retailed for something less than $200. Frankly, we think he meant to make a $100 box, but simply couldn't learn how to produce one that cheaply which would satisfy his exacting demands.

Last fall Bill was all set to run a scare campaign against "poison gas" refrigerants. Particularly was he gunning for sulphur dioxide. In the Dec. 7 issue of ELECTRIC REFRIGERATION NEWS we reported some of the advertising "smell copy" which was all set to shoot.

After the story came out in the News several presidents of manufacturing concerns in the Nema group got together to see what they could do to stop the campaign. It was like belling the cat. They decided they probably couldn't have much influence.

The council of the American Society of Refrigerating Engineers met, however, and decided that no matter how much they themselves might quarrel about refrigerants in private, they didn't want their dirty linen aired in public.

So they pointed out that carrene (Grunow's refrigerant) decomposes in the presence of a flame into possibly toxic gases, threatened to start a counter stink if Grunow went through with his program, and thus got Carrier (manufacturer of carrene) to persuade Grunow to call off his dogs.

The new Grunow advertising campaign, slated to begin in the May 6 *Saturday Evening Post*, will feature the slogan, "It's Time America Knew 'What's Inside' an Electric Refrigerator," but will not mention sulphur dioxide.

It will, however, offer this challenge:

"Mrs. America: May we suggest a test? To be absolutely certain you are selecting a safe, efficient, money-saving refrigerator, ask your dealer to show you the liquid which freezes the ice cubes and keeps the interior of the refrigerator at the proper temperature. "Tell him to let you see it, smell it, hold it in your hand and light a match to it. If he is a Grunow dealer, he will gladly open the refrigerating system for you and make these tests."

* * *

Reverse English

In re the subject of refrigerants, Volume 3, Number 9 of *Kelvinator Sales Slants* is devoted to a comparison of sulphur dioxide (used by Kelvinator and Leonard) and methylene chloride or "carrene" (used by Grunow).

Before you've finished reading this little booklet it will have you believing that sulphur dioxide is really beneficial to human beings, and that methylene chloride is a dangerous anesthetic and poison!

It's a masterpiece, and you should read it. Told in the form of a dialog between Salesman Jasper Tullis and Salesmanager "Two Call" Hogan, it sustains interest to the end in a highly convincing fashion. GEORGE WILCOCK, we understand, is the author.

* * *

Fremont Wilson

Much as we hate to use the hackneyed old term, "stormy petrel," we know of no cognomen which better fits FREMONT WILSON, the code man. It's difficult to talk about refrigerants and not mention his name.

It was Fremont who, with E. T. WILLIAMS and others, was instrumental in handing over the New York apartment house market to General Electric and Electrolux some years ago—by instigating an ordinance prohibiting the installation of multiple systems.

It was Fremont who kept the pot boiling at the Chicago code battle of 1929. It was Fremont who led the fight against F-12 last year.

But we needn't go on like this. You know who he is.

What we were trying to get around to say was that Mr. Wilson has been confined to his bed all fall, and that he has just returned from a convalescence in Florida.

We visited him and his charming, patrician wife at their suite in the Dixie hotel recently, and found him in a mellow mood.

As you might imagine, Mr. Wilson lives where the currents and strife of life are thickest and strongest—at the corner of 42nd St. and Broadway.

The Dixie hotel, where he lives, plays host to hosts of theatrical people and other colorful individuals. Fremont, a good showman himself, is right in his element.

* * *

An Untold Story

Mr. Wilson is undoubtedly one of the most mysterious individuals in the entire refrigeration industry.

Nobody seems to know *who* he is, *whom* he is working for, *what* he gets out of it, *how* he gets his information and influence, *where* he comes from, and *why* everything else about him. But everybody is curious.

O.K. Your biographical reporter has been on the job, and has the following background for you:

Mr. Wilson came from a long line of shipbuilders. Early he learned rudiments of that hearty trade—taught by tough, strapping brothers who were slave-drivers.

After a year and a half of college, young Fremont returned to the world of brawn and 12-hours-day toil. He became a master carpenter.

A short period as a telegraph operator was interrupted when he answered an advertisement of the Edison Electric Illuminating Co. (foster-father of the public utility industry) for a carpenter with shipbuilding experience--and got the job.

He rose rapidly.

Thomas A. Edison himself taught young Mr. Wilson the intricacies of electric power station operation and maintenance.

Soon he became Edison's trouble-shooter, traveling all over the country to put ailing power stations in order. Connections, hook-ups were the chief source of trouble.

Stations were set up hastily all over the land. But often, after the station was put up, it produced no electricity. Came then the call:

"Send for Wilson!"

Fremont laughs when he recalls those days. It was all so simple—knowing what should be connected to what (after Mr. Edison had explained it all so carefully), but to the green engineers in the hinterland, Mr. Wilson was known as "the wizard."

"Bluff! That's all it was!" chuckles Mr. Wilson today.

Soon he entered upon a period of electrical contracting. At one time he was supervising practically all of the interior wiring in the city of New York.

This was still before the turn of the century.

Followed then a period of special jobs for George Westinghouse (founder of the Westinghouse Electric & Mfg. Co.). This one, for instance:

In 1892 he surveyed the electrical needs of the 1893 Chicago World's Fair, prepared an estimate for the whole gigantic enterprise, and submitted it to Mr. Westinghouse. Using this estimate as a basis for a bid, Westinghouse won the contract.

Before long it became apparent that codes were going to be necessary. Untutored political appointees were passing inadequate wiring jobs, condemning good ones. Began then Fremont's long series of connections with New York City's governing element.

One thing led to another, and soon he was being retained by insurance companies. The word got around that he knew a good electrical installation when he saw one.

From 1893 until 1917 Mr. Wilson conducted the Electrical Testing Bureau. Thirty-three (33—count 'em) insurance companies were his clients. If Fremont said the wiring was O.K., the building could be insured; otherwise, ix-nay.

His Electrical Testing Bureau finally became the Underwriters Laboratories, Inc.

Today he is a consulting engineer, specializing in getting equipment approved by the Underwriters and by municipal inspection departments—also in throwing monkey wrenches into machinery various manufacturers have set up to pass codes which measure up to their specifications. Knows his way around official Washington, as well as around Tammany.

Don't know how old he is. Has platinum hair. Probably past 60. But he's still a real scrapper.

* * *

Dramatic Dept.

Don't let anyone kid you about "Design for Living." It is not the best play on Broadway. It is amusing, and is polite, even entertainment. But it does not deserve the hosannas and salaams it is receiving.

This humble pilgrim, at least, refuses to worship at its shrine.

NOEL COWARD wrote it, and co-stars in it with ALFRED LUNT and wife (LYNN FONTANNE). It is an authentic Coward, a first-edition Coward—and that means the plot is original, the philosophy ultra-ultra, and the lines priceless. With another cast, it would undoubtedly make a grand bit of fun.

But this old carp has risen for the last time to the bait of Mr. and Mrs. Lunt. We were struck dumb by their "The Guardsmen," fell prostrate before their "Elizabeth the Queen," and wanted to go off somewhere and die after their "Reunion in Vienna" lest we see another play which might spoil the illusion.

Well, we've seen it. And the illusion is gone. Lynn Fontanne is an overweight, hard-voiced Juno whose monotone drawl is as empty and irritating as her calm superiority. She is still playing a heavy Elizabeth, ignoring the fact that her role calls for gaiety, sparkle, and a lightness of touch. Alfred Lunt is an egocentric Thespian who has apparently begun to envision himself as The Real Hamlet at Last. So there.

We've always thought New York City the greatest sucker town in the country. Worship of this show helps prove the thesis. Its blind acceptance of this play as the Ultimate is condemning evidence of its obeisance to a Name (in this case, three Names), its haste to fasten fealty to anything labeled "sophisticated."

Frankly, there are better shows in New York City. INA CLAIRE in S. N. BEHRMAN'S "Biography," for instance.

And that leads us up to the reason why we mentioned this season's plays at all. We watched Miss Claire intently from a front row seat, and we'll swear that she's a dead ringer for EDWINA NOLAN. Oh, perhaps her is a nice looking boy whom she grew up with and might have married but didn't. That's exactly the situation between them in the play.

* * *

950 Tons of Refrigeration

While we're on the subject of shows we should pause to lay a wreath at the foot of Radio City, biggest show in New York City today.

Conceived by "ROXY" ROTHAFEL, executed by MERLIN H. AYLESWORTH (former president of the N.E.L.A., and now R.K.O. head—he hasn't many letters of the alphabet left, especially when you add the call letters of all the radio stations under his indirect direction) and OWEN D. YOUNG, and financed by JOHN D. ROCKEFELLER, JR., the Radio Music Hall is the most amazing theater of the age.

Here is one place where the superlatives so dear to advertising copy writers and publicity men are genuinely applicable.

Seats 6,200 persons, with the aid of three mezzanines. Has a giant 144-foot stage, above which the proscenium arches 60 feet. Replacing 200,000 tons of excavated earth are 11,000 tons of steel and 9,600 tons of brick.

And while we're on the subject of figures we should note that the Music Hall has a Carrier air-conditioning system using 625 tons of refrigeration; while its cousin, the neighboring RKO Roxy, uses a 325-ton system—950 tons altogether.

The Music Hall job moves 240,000 c.f.m. (cubic feet of air per minute), and the Roxy system moves 100,000 c.f.m. Music Hall uses 1,800 gallons of water per hour; the Roxy 1,000 gals. per hr.

In the Music Hall engine room there are three Carrier condensing units of 300, 250, and 200 hp., respectively. In addition there's a 25-hp. Frick CO_2 machine for cooling circulating ice water.

All these wonders—and figures—were shown us by Messrs HENRY and McMAHON of the Radio City engineering staff. They're proud as heck of their equipment.

Rockefeller Center went up quickly. Your correspondent noted its rise during fairly frequent trips to New York City last year.

Today they're still working on it. But its form and plan is now entirely evident. And one sees that it is exemplary of that newest and sanest architectural theory — functional beauty (making it look like what it is and what it's for—instead of putting a 16th century mask and wig on it).

That applies to the theater, too. Its style fits in with its purpose.

Noted critics who attended its opening went away shaking their heads. It was too big. Too simple. Too almost everything. And what on earth could be done with it?

It has been demonstrated in the last few weeks, however, what can be done with it.

They have been packing the house. Because of its enormity it has required the development of a new stage technique. It has required dramatic artists who, as Kipling dreamed it, "paint on a seven-league canvas with brushes of comets' hair."

And the mighty stage panoramas which have been worked out for the giant stage are gasp-evoking, indeed. Five and fifty pairs of legs high-kicking in a perfect row, georgetted pixies sitting on clouds and the moon while sprites dance around the world, three centuries of history in tableaux—the possibilities seem limitless.

After the ornate and gaudy picture palaces built during the Era of Crazy Financing, the simplicity and functionalism of this, the world's largest theater, is a distinct relief. Instead of sitting uncomfortably in an oriental potentate's throne room, one watches a show undistracted in a domed, acoustically near-perfect pantheon.

Seats are equipped with electric program lights, as in the Casino theater built by EARL CARROLL. For the use of deaf persons are acousticon seat-phones.

All is spacious and comfortable and conducive to pleasant audiencing.

* * *

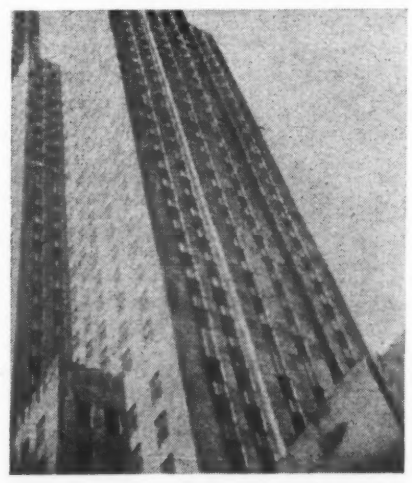
Big Events

WALTER DAILY, G. E. refrigeration sales promotion manager, will be pleased to learn that the *Coin Machine Journal* considers his stunt of sending a trainload of movie stars across the continent to advertise the General Electric kitchen one of the two big events of the spring. We quote:

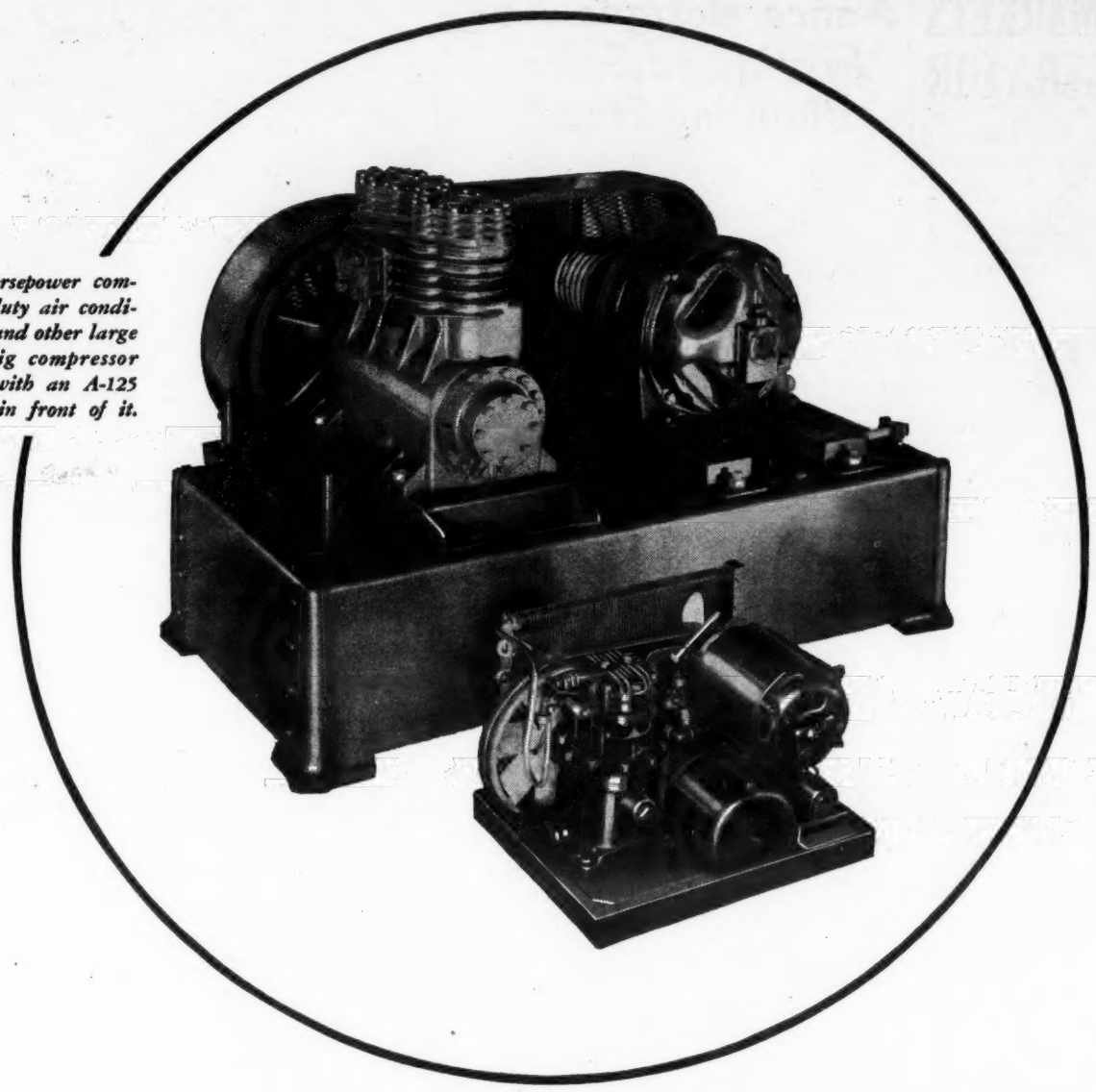
"Thousands of people throughout the country will be viewing these features of the show taking place with other national events, such as the Inauguration, Warner Bros.-G.E. '42nd Street Special' and the like.

Hichborn Sells An Idea

Paul Hichborn, Rex Cole's retail sales manager, explains his newest stunt to P. B. Zimmerman, manager of the G. E. specialty appliance department. Fred Harvey (left), eastern representative, is startled at the presence of a camera.



Radio City shoots skyward.



● *Here is a new 4-cylinder, 10 horsepower compressor built specifically for heavy duty air conditioning requirements in retail stores and other large establishments. The size of the big compressor is emphasized by its comparison with an A-125 household compressor photographed in front of it.*

FRIGIDAIRE IS FIRMLY ESTABLISHED IN THE AIR CONDITIONING BUSINESS

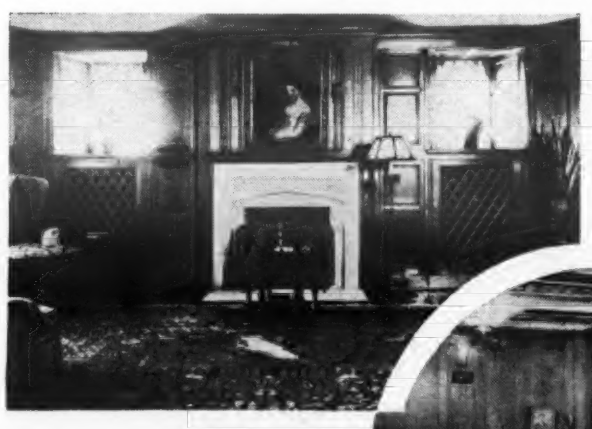
AND HAS WIDENED SALES POSSIBILITIES THIS YEAR WITH NEW HEAVY DUTY AIR CONDITIONING EQUIPMENT

Today's new and sensational developments in Frigidaire Air Conditioning equipment are the result of long experience and wide research in this field of refrigeration.

Frigidaire Air Conditioning equipment has been used for a number of years in residences, offices, stores, restaurants, factories, warehouses, railway cars, yachts, and numerous other places. Its efficiency has been proved by practical service in all kinds of installations where correctly tempered air is essential to comfort, profit, personal efficiency, or industrial processing.

The range of Frigidaire's operation in air conditioning is now greatly enlarged by the production of new compressors, evaporators, room units, store units, and other apparatus for both unit-type and duct-type systems. Practically all problems of air conditioning can be met with the present line of Frigidaire equipment. Frigidaire Corporation, Subsidiary of General Motors Corporation, Dayton, Ohio.

A residential application of Frigidaire Air Conditioning.



A Frigidaire-cooled hotel dining room.

Frigidaire comfort cooling assists in selling wearing apparel and improves the appearance of furs.

Frigidaire Air Conditioning provides comfort and promotes efficiency in this office.

FRIGIDAIRE

AIR CONDITIONING EQUIPMENT

COPELAND MARKETS $96 REFRIGERATOR

(Concluded from Page 1, Column 3)

The new cartridge-type Copeland refrigerating unit will be used in all models.

Production has been scheduled on the new cabinets so that April shipments can be handled promptly, Mr. Hadden states.

Thermocraft insulation two and three inches thick will be used in all models. Shelves are of the flat bar type, and the hardware chromium plated. The cabinets set on 8-in. legs. The 4-ft. boxes are equipped with glass defrosting trays, and the 5- and 6-ft. boxes with porcelain trays. All models are equipped to provide an abundance of ice cubes.

The new line is provided with Penn controls using the standard defrosting cycle, black trim strips, black moulded rubber door gaskets, black wipe on door inside pan, and shelf hold-down clips as required. The four-foot box has bottom mounted condensing unit and cut-out lower shelf. The five and six-foot boxes have top-mounted condensing units, telescoping lower shelves and black rubber shelf knobs.

FT. WAYNE COMPANY WILL DISTRIBUTE COPELANDS

MT. CLEMENS, Mich. — Home Equipment Co., Ft. Wayne, Ind., has been appointed Copeland distributor for the northern part of Indiana, according to C. W. Hadden, general sales manager of Copeland Products, Inc.

For the past 10 years, the Home Equipment Co. has handled a complete line of appliances for the home, ranging from stoves to air-conditioning equipment.

Nance Resigns As Frigidaire Sales Planning Head

DAYTON—James J. Nance, formerly manager of the sales planning division of Frigidaire Corp., has been appointed vice president in charge of sales of the Standard Register Co., according to announcement made last week by John Q. Sherman, president and general manager of the Standard organization.

Mr. Nance assumed his new duties April 7 with headquarters at the Standard Register plant in Dayton. He had been associated with Frigidaire for six years, lately in charge of promotional and educational activities. Prior to his Frigidaire association, he was a member of the selling division of National Cash Register Co.

The Standard Register company has national sales representatives in all key cities, sells business, tabulating, and billing machines, and has recently introduced new products which widen its field of selling operations.

Members of Mr. Nance's staff at Frigidaire tendered him a farewell party April 5 at which he was presented with a desk light and pen set. H. W. Newell, vice president in charge of sales, expressed the regret of the management over his leaving.

TENNESSEE ELECTRIC TO SELL KELVINATORS

KNOXVILLE, Tenn.—East Tennessee Electric Co. has taken over distribution of Kelvinator products in a territory comprising the major portion of Tennessee, six Kentucky counties, four counties in Virginia, and one in northern Georgia. Paul R. Fuqua is president of the new company.

A Trainload of Norges

Officials of Norge Corp. and Trilling & Montague, Norge distributor, stand in the rain to greet a trainload of Norges coming into Philadelphia.

Domestic Industries to Build 2-Door Model

(Concluded from Page 1, Column 5)

(with bottom-mounted units) are also the same, except that the three larger models are now available in either lacquer or porcelain exteriors.

The new Richland model has 8.5 cu ft. of storage capacity, 11.4 sq. ft. of shelf area, and produces 105 ice cubes (7½ lbs.) in four ice cube trays, one a deep pan.

A number of the company's sales outlets are now handling the Aquazone air conditioner, manufactured by the Corozone Co. of Cleveland. This is a portable ice room cooler equipped with an electrical device for imparting ozone to the air.

TRAINLOAD OF NORGES GO TO TRILLING & MONTAGUE

PHILADELPHIA — Norge dealers and salesmen in this territory gathered on the night of April 6 in the Elks Hotel here to celebrate wth their distributor, Trilling & Montague, the arrival in Philadelphia of 24 carloads of Norge electric refrigerators with which they will open their spring drive.

Including the wives of the men who attended the celebration, 1,000 persons were present.

Plan of the meeting called for division of its program into four parts, according to the distributor—one part business, three parts celebration.

After a short business session, at which final sales plans for the spring drive were discussed, John H. Knapp, Norge Corp.'s vice president in charge of sales, addressed the visiting dealers and salesmen, told them how to boost Norge sales.

Remainder of the evening was given over to celebration of: arrival of the trainload of Norges—which, say Norge officials, constituted the largest single order placed by any distributor in the history of the organization; price reductions on the entire Norge line; and legalization of 3.2 per cent brew.

Promptly at midnight, everyone present at the celebration was served with the newly legalized refreshment, which, say officials of the distributorship, will "usher in a new era of prosperity" in this territory.

SERVEL ANNOUNCES NEW POLICY FOR DISTRIBUTORS

(*Concluded from Page 1, Column 1*)

handle distribution in other towns and counties in their territories on a wholesale basis.

Under terms of the new plan, Mr. Jones points out, a department or furniture store may now be franchised as an official Servel distributor.

Currently with this change of distribution policy came announcement that Servel is lengthening its dealer discounts, that the factory will from now on cooperate directly with dealerships in local advertising and sales promotion projects, and that factory representatives will work with dealers and their salesmen.

Discussing that part of the new policy which directly concerns dealers, Servel officials say that it is a plan "to increase sales and cut selling costs by reducing the number of hands in the line of sales."

They believe that the plan requiring new distributors to operate on a retail basis in their own communities will insure more thorough and efficient coverage in the country's larger cities than was had before, and that this, coupled with the new longer discount, will make for more aggressive sales activity in these centers.

G. E. SUPPLY CO. TO HANDLE HOTPOINT REFRIGERATOR

(Concluded from Page 1, Column 5)

will probably be $115.50, $145, and $190, respectively, for the three models. The refrigerator is to be covered by a one-year guarantee.

EASTERN DISTRIBUTOR

NEW YORK CITY—Royal-Eastern Electrical Supply Co., wholesale distributor of General Electric merchandise here, announced publicly on April 5 that it has taken on the Hotpoint refrigerator line and is ready to franchise retail outlets for the product.

KELVINATOR TO BE USED ON EGYPTIAN TRIP

WASHINGTON, D. C.—Kelvinator equipment for a refrigerator installation was among other equipment taken along by H. H. Zodtner, leader of the Smithsonian Institute's latest Egyptian expedition.

LEADERS ANNOUNCED IN G. E. 'MAN HUNT'

CLEVELAND, April 10 (Special Wire to ELECTRIC REFRIGERATION NEWS) —Tabulation of the first week's results in the "Man Hunt," General Electric sales contest on G. E. appliances which opened April 3 to run for a period of 53 days, finds distributors who are generally near the top in Refrigerania's contests leading in the campaign for the offices of "district police commissioners" in the seven territorial districts.

The "Man Hunt," (the contest follows the theme of a police war against law violators) officially opened at sunrise April 3, with some of the distributors taking this order literally —Pendergraph-Brown organizations in Nashville, Memphis, and Chattanooga reporting for duty at 5:30 a. m. and the R. Cooper Jr., Inc., Chicago group holding an opening rally at 7:15 a. m.

District ranking at the close of the first week show that Minneapolis Distributor O. F. Stuefer leads in his territory and is thus entitled to wear the badge of district commissioner of police until the lead is wrested from him. The "early bird" efforts of Dick Cooper's men evidently had some effect, as he is right on Stuefer's heels. M. A. Glueck of Kansas City is in third place.

Albert Ahrens of Oklahoma City, Refrigerania's president, appears to be out after more laurels, as he is leading other distributors in the Southwestern district, which G. E. refrigeration department officials declare has produced the best results since the contest opened. Mark Wright, San Antonio distributor is a close second, with Tom Sullivan of General Appliances, Inc., holding down third place.

C. L. McCrea of the National Electrical Supply Co. in Washington, D. C., who makes a habit of taking honors in sales contests, is out in front in the Atlantic district, but is being given a hot fight by L. W. Driscoll, Charlotte, N. C., distributor, and W. M. Perry of Perry-Browne, Columbia, S. C.

In the central district, M. E. Brown of A. H. Thompson-Sterling, Inc., Louisville, Ky., has earned the badge of commissioner in the first week with the Electrical Housekeeping, Inc., organization of Cleveland, and Syd Caswell of Detroit is his nearest rival for the honor.

E. P. Cone of El Paso, Tex., topped all others in the Rocky Mountain district "man hunting" activities, but A. J. Finck of Storz Electric Refrigeration Co. in Omaha, Neb., and J. E. Blomquist of G. E. Supply Co. in Salt Lake City are not out of sight.

H. H. Kelly Courtright of Fresno, Calif., tops all others in the West Coast district. L. H. Bennett of San Francisco is second, with C. W. Hartenfells of G. E. Supply Co. of Portland, Ore., a close third.

Cooper Men Rally

CHICAGO—Three hundred seventy-five General Electric dealers and salesmen pinned on their police badges and officially declared war on sales resistance when they met at 7:15 o'clock on the morning of April 4 to pledge their support to R. Cooper Jr., G. E. distributor in the Chicago area, at the opening of the General Electric Man Hunt sales contest.

After a breakfast at the Palmer House, the salesmen were addressed by P. B. Zimmerman, manager of the special appliance department of the General Electric Co., and Mr. Cooper.

H. W. Gifford, vice president of the distributorship, who was in charge of the meeting, then announced that on the day before—opening day of G. E.'s nation-wide contest—the Cooper sales organization had sold its quota for the entire first week of the drive.

Guests at the breakfast were Dr. Ellis Manning, George Kobick, J. R. Poteat, John M. Wicht, A. M. Sweeney, A. T. Milliott, J. S. Strecker, and R. H. Ferguson.

WILLIAMS CUTS PRICES ON ICE-O-MATIC MODELS

(Concluded from Page 1, Column 4)

capacity, $169; model L-64-T, 6.4 cu. ft. in capacity, $195; model D-72 (all porcelain) 7.2 cu. ft. in capacity, $269; model P-53 (all porcelain), having a 5.3-cu. ft. net capacity, $189; and model P-64 (all porcelain), with a net storage space of 6.4 cu. ft., $215.

In announcing these price reductions, Mr. Bell told distributors: "This is not to be construed as an attempt on the part of this company to enter any price war.

"People have suppressed the natural desire to spend for such a protracted length of time that they must be dramatically 'shocked' into a realization of the splendid buys which await the purchaser on every side.

"Indications are that an early rise in the price of materials will force a raise in prices covering the Ice-O-Matic line."

LOOK

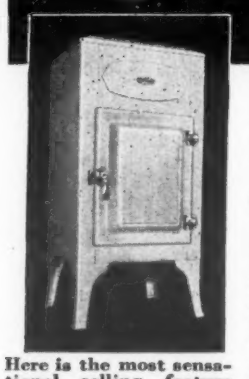
The SHELVADOR

U. S. PATENT 1898922

An exclusive patented feature of the

New CROSLEY Electric REFRIGERATOR

See at a glance the wonderful convenience of the SHELVADOR



Here is the most sensational selling feature ever thought of in ELECTRIC REFRIGERATION . . . the most sensational advance in cabinet design since the first icebox was brought out . . . a feature so self-evident, so new, so convenient and helpful that every housewife after one glance will say: "*That's what I must have!*"

NOW the housewife merely opens the door . . . and *there* is the egg, bacon or the orange, or the butter, or any other small and ordinarily hard-to-find thing. It's on its shelf in the door. No reaching. No searching. No stooping. No lost time. No spilled food. *There* is what *you're* looking for.

Increases "Usable" Capacity 50%

Shelvador makes the "small" refrigerator "larger" by increasing its usable capacity. Try to put everything that goes into the Shelvador into your refrigerator and you'll be amazed. An orange takes as much "shelf room" as a bottle of milk in the ordinary refrigerator . . . in the Shelvador it only takes as much room as an orange should.

An Exclusive Crosley Feature

Shelvador is the newest and most important improvement in electric refrigeration since the invention of this great home necessity. To buy an electric refrigerator without the Shelvador is not only to deprive oneself of the great convenience and economy of Shelvador, but is to buy something already outdated. For no electric refrigerator can possibly be modern in the fullest sense without this feature.

SHELVADOR is an exclusive, patented feature of the new Crosley Electric Refrigerator. No other refrigerator manufacturer dare use it.

Low Cost—High Quality

When you buy a Crosley Electric Refrigerator, you not only save money on first cost, because of Crosley's quality-mass production methods; but you also save money because of the greatly enlarged "usable" capacity of the Crosley Electric Refrigerator due to the Shelvador. If the Crosley Electric Refrigerator did not have the Shelvador, it would still be the world's most remarkable refrigerator value. With the Shelvador, it goes far beyond the ordinary concept of "your money's worth" that there is nothing with which the value may be compared.

The Crosley Electric Refrigerator, famous last year for its trouble-free, service-free operation, has this year been refined in several points to make it even better. It is not possible, at any price, to get a better refrigerator value than the Crosley. It is not possible, in any other refrigerator to get the Shelvador.

See your dealer. Study the Shelvador. Instantly you can see its advantages and convenience. Instantly you can see how annoying and unnecessary it is to have electric refrigeration without the Shelvador.

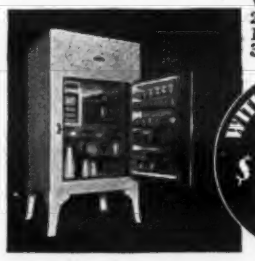
MODEL D-35 NET contents — 3½ cubic feet. Shelf area—8 square feet. Overall Dimensions: Height, 50⅝". Width, 23⅞"; Depth, 24"; Leg Height, 10⅞" No. ice trays 2; No. ice cubes 42.

WITH SHELVADOR $95

MODEL D-45 NET contents — 4½ cubic feet. Shelf area—10.6 square feet. Overall Dimensions, Height 56⅞"; Width, 23⅞"; Depth, 24"; Leg Height, 10⅞" No. ice trays 3; No. ice cubes 63.

WITH SHELVADOR $105

MODEL D-60 NET contents—6 cubic feet. Shelf area—11.5 square feet. Overall Dimensions: Height 57½"; Width, 29¼" Depth, 25⅞"; Leg Height, 10⅞"; No. ice trays, 3; No. ice cubes 63.



WITH SHELVADOR $130

ALL PRICES INCLUDE DELIVERY..INSTALLATION..ONE YEAR FREE SERVICE

Montana, Wyoming, Colorado, New Mexico and west, prices slightly higher.

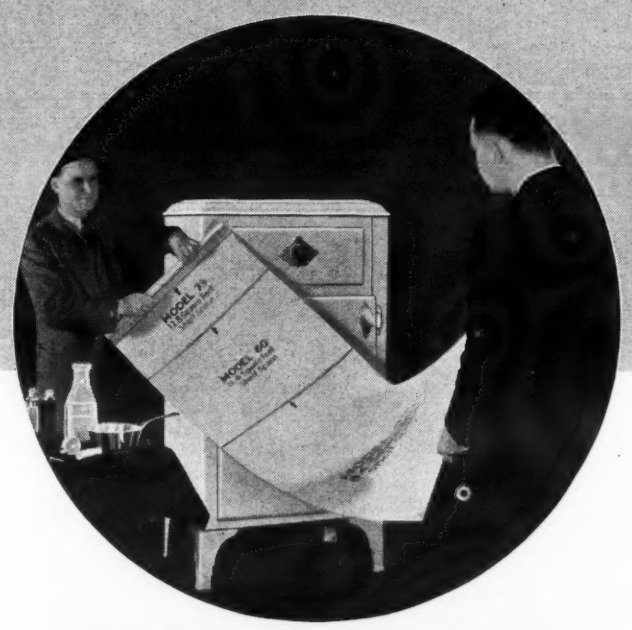
The Crosley Radio Corporation - Cincinnati

POWEL CROSLEY, JR., President. The Home of "the Nation's Station"-WLW

CROSLEY Electric REFRIGERATOR WITH SHELVADOR

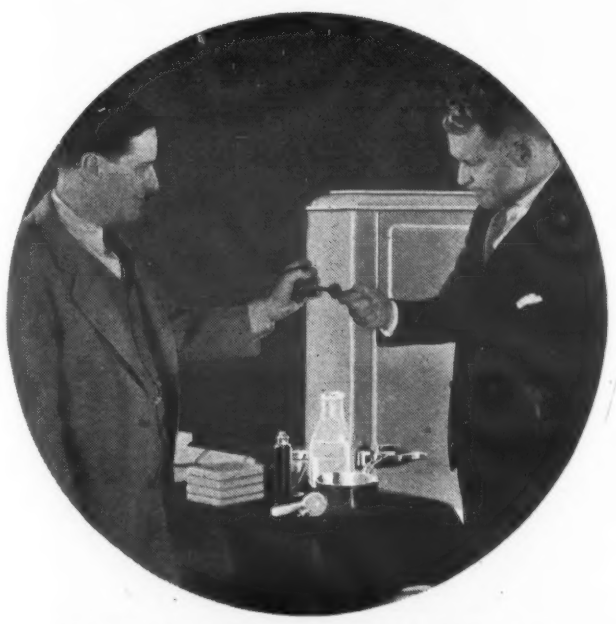
U. S. PATENT 1898922

CONVINCING PROOF!



TALK ABOUT SHELF AREA! . . . just unroll this sheet and see how much shelf area Westinghouse designers have actually achieved . . . learn what commodious food space should mean.

SEE WHAT DUAL-AUTOMATIC MEANS! . . . Dual-automatic isn't just a word we've coined for advertising. This demonstrator *proves* it, *proves* it in a way you'll never forget.



PRECISION WORKMANSHIP—SEE FOR YOURSELF! . . . one ten-thousandth of an inch is mighty small, but now you can *see* it, *see* what it means to the efficiency and long life of the Westinghouse Dual-automatic mechanism.

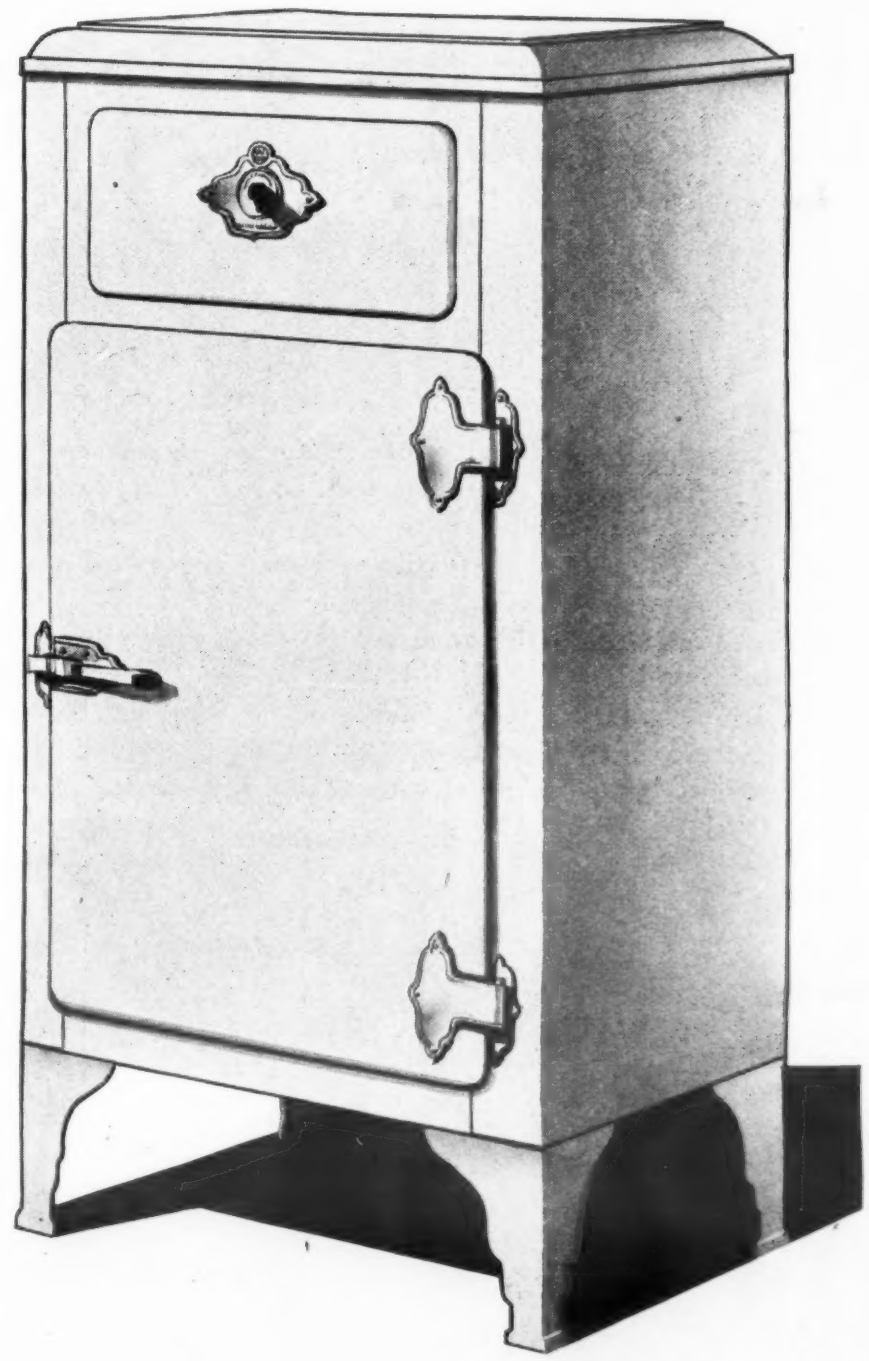
Dramatic, convincing proof of Westinghouse advanced convenience and extra dependability in a new demonstration that's

CLOSING SALES

●Smart merchandisers and equally smart purchasers of 1933 electric refrigeration want no more claims without *convincing proof. "Prove it,"* they say.

Why does forced-draft cooling make the HERMETICALLY-SEALED unit more efficient? Why does DUAL-AUTOMATIC control make it more dependable? What is the TRUTH about the porcelain evaporator, the permanent sealed-in oil supply, the insulation, the all-steel cabinet? You'll see for yourself, you'll believe, and you'll never forget . . . once you've seen the remarkable new dramatic demonstration Westinghouse now makes available to its selling organization. Here is convincing proof of every claim to superiority of the Westinghouse Dual-automatic Refrigerator. Here is a demonstration that's *closing sales!*

We urge every merchandiser interested in selling more refrigerators in 1933 to see this demonstration. See how far the factory is going with Westinghouse Dealers in merchandising and advertising support. Write, wire or telephone for complete Franchise facts today! Westinghouse Electric & Manufacturing Company, Refrigeration Division, Mansfield, Ohio.



Westinghouse

Dual-automatic **REFRIGERATOR** *Hermetically-sealed*

7 MEN APPOINTED TO FRIGIDAIRE DIVISION

DAYTON, April 8.—Appointment of seven men by the household sales division of Frigidaire Corp., was announced today by F. R. Pierce, sales manager of the company.

Six of the men will act as contact representatives for the factory in regional territories, visiting district managers and distributors, dealers, supervisors, and individual salesmen, according to Mr. Pierce.

R. J. Richards, formerly assistant southeastern regional manager, will assist Mr. Pierce in directing the group.

The six members of his staff are: Ellsworth Gilbert, formerly a member of the sales planning division; Charles J. Allen, also a former sales planning division member; F. W. Beecher, formerly head of the organization department; Ralph L. Winegarner, formerly of the north central regional staff; D. T. Hayward, formerly factory representative in the southwestern region; and J. F. Cain, formerly sales promotion manager, Frigidaire Sales Corp. of New England.

G. E. Stockholders Will Meet April 18

SCHENECTADY, N. Y.—The annual meeting of the stockholders of the General Electric Co. will be held at the company's office here April 18 at 11 a. m.

Directors will be elected for the ensuing year. Only the holders of common stock of record at the close of business hours on Friday, March 10, will be entitled to vote.

Utility Sponsors Shows in Four Cities

NEWARK—Public Service Electric & Gas Co. of New Jersey, with headquarters here, has sponsored electric refrigeration exhibits in four cities of its territory since the beginning of April, now has two others under way, and will hold two more before the end of this month.

In charge of the exhibits is F. D. Pembleton, assistant general sales manager of the utility, and state director of the Electric Refrigeration Bureau.

First show opened April 1 in the lobby of the Brook Theater at Bound Brook, and will continue through April 14. From April 3 to 8, another exhibit was held in the lobby of the Fox Theater at Hackensack.

A Jersey City exhibit was held from April 6 through April 8 at the local utility office. Other shows were sponsored at the same time in West New York and Paterson.

Opening today is another electric refrigeration exhibit in Passiac which will last through April 14. An exhibit will be sponsored in Camden from April 19 to 22, and another is scheduled to open in Newark in a few days.

REFRIGERATION FEATURED IN UTICA EXHIBIT

UTICA, N. Y.—Electric refrigeration was a feature of an appliance exhibit held April 3 to 8 by Utica electrical dealers in the main show room of the Utica Gas & Electric Co. G. H. Day, chairman of the Utica Electric Refrigeration Bureau, was in charge of the showing.

WASSON TO MANAGE ICE-O-MATIC BRANCH

CHICAGO—L. D. Wasson, formerly associated with the General Electric Co., has been appointed refrigeration sales manager of the Williams Oil-O-Matic Heating Corp. factory branch here.

Mr. Wasson is at present effecting a new set-up for distribution of Ice-O-Matic commercial and household refrigeration in metropolitan Chicago.

The new branch sales manager was connected with the General Electric Co. from 1912 to 1924 as supervisor of control production in the company's Schenectady plants.

After an interval of six years with other organizations, he became manager of the refrigeration department in Puerto Rico for the International General Electric Co. in July of 1931, and remained in that position until September of last year.

Satterlee & Blue Moves To New Building

KANSAS CITY, Mo.—Satterlee & Blue, Inc., retailer for Westinghouse electric refrigerators, and Columbian Electrical Co., wholesaler of Westinghouse products in western Missouri, Kansas City, and eastern Kansas, have leased the ground floor and basement of a building at the intersection of Walnut street and Grand avenue.

According to William B. Satterlee, president, and Walter S. Blue, vice president and treasurer of the Columbian Electric Co., and owners of the affiliated firm bearing their names, they will have 18,000 more square feet of space.

Australia Lifts 50% Surcharge On Units

SYDNEY, Australia—By an act of the Australian Parliament, the 50 per cent surcharge imposed in 1930 on electric refrigerators manufactured outside of Australia was lifted March 9.

This means that manufacturers outside of Australia are now obliged to pay only regular duties to ship their refrigerators into this country.

Manufacturers in Great Britain proper must now pay a duty of only 55 per cent. Manufacturers in "intermediate" areas (British colonies) are subject to payment of a 65 per cent duty. Refrigeration manufacturers in foreign countries, such as the United States, must now pay a 75 per cent duty on their products.

5-Year Exports to United Kingdom

SYDNEY, Australia—During the five years between the first of 1927 and the end of 1931, electric refrigeration manufacturers in the United States shipped $5,561,363 worth of household refrigerators and commercial units up to one ton in capacity to the United Kingdom, it is shown by figures compiled by *Refrigeration, Cold Storage, and Air Conditioning*, Australian publication.

During the same period, Canada purchased $9,158,424 worth of domestic models and commercial units up to one ton in capacity from the United States, and Australia bought $2,535,768 worth.

Tariff on electric refrigerators was not in effect during the first three years of this period, and during that time, refrigeration equipment valued at $2,527,327 was purchased by the United Kingdom.

Canada bought $5,222,150 worth of equipment during that three-year period, and Australia purchased $2,311,429 worth.

During 1930 and 1931—after the tariff went into effect—equipment valued at $3,034,036 was shipped to the United Kingdom, $3,936,274 worth went from the United States to Canada, and $224,339 worth was sent to Australia.

Total value (in dollars) of exports to each country for each year of the five-year period are given by the Australian publication as follows:

United Kingdom: 1927, $1,176,749; 1928, $328,688; 1929, $1,021,890; 1930, $1,077,668; 1931, $1,956,368.

Canada: 1927, $337,354; 1928, $2,459,545; 1929, $2,425,251; 1930, $1,893,222; 1931, $2,043,052.

Australia: 1927, $650,723; 1928, $738,481; 1929, $922,225; 1930, $217,772; 1931, $6,567.

CORNYN WILL MANAGE NORGE SALES

AMARILLO, Tex.—John Cornyn has been appointed sales manager in charge of Norge refrigerator sales of the Amarillo Lumber Co., Inc.

ALLISON ADDRESSES HACKENSACK BUREAU

HACKENSACK, N. J.—More than 125 electric refrigeration distributors, dealers, and public utility officials were present at the first annual dinner of the Hackensack Electric Refrigeration Bureau held at the Elks Club here on April 3.

Dr. G. W. Allison, field manager of the National Electric Refrigeration Bureau, was principal speaker. Prior to his address short talks were given by Charles Plenty, president of the New Jersey State Bankers Association and John Borg, publisher of the *Bergen Evening Record.*

Dr. Allison urged members of the emphasis on the need for refrigeration from the standpoint of health, convenience, and economy, than upon the product itself.

'Do Not Buy Gadgets'

"People do not buy gadgets," said Dr. Allison. "They buy convenience and health protection. More than $800,000,000 worth of food stuffs is wasted annually by the American people."

He added that food poisoning causes more deaths than any other single factor which threatens man's health, and asserted that it is much more important that the public be apprized of facts like these than confused with a mass of detail as to how this or that refrigerator works.

Among guests at the affair were H. P. J. Steinmetz, general sales manager of the Public Service Electric & Gas Co., New Jersey utility; Philip H. Harrison, president of Philip H. Harrison & Co. (Newark G. E. distributor) and president of the Essex Electrical League; H. P. Litchfield, manager, Graybar Electric Co., Newark; F. D. Pembleton, assistant general sales manager of the Public Service Electric & Gas Co., and state director of the Electric Refrigeration Bureau.

Driscoll Is Toastmaster

Frank H. Driscoll of Driscoll-Harrison Co., acted as toastmaster in his capacity as chairman of the Hackensack Electric Refrigeration Bureau. William Haight, Hackensack agent for the utility, is secretary of the bureau.

A talking motion picture, "Just Around the Corner," featuring the G. E. all-electric kitchen, was shown through courtesy of Philip H. Harrison & Co.

After dinner, the banqueters were guests of the Fox Theater, in the lobby of which the new local bureau was opening its six-day electric refrigeration exhibit.

Two Distributors Order Carloads of Copelands

MT. CLEMENS, Mich.—Two distributors of Copeland electric refrigerators visited the Copeland factory here last week and placed orders for one carload of refrigerators each. They were R. F. Boyland of the Good Housekeeping Shop Co. in Columbus, and G. Roy Clark of George A. Clark & Son, Minneapolis.

The whole commercial field is your market with

ICE-O-MATIC Refrigeration

When you walk in to sell a man commercial refrigeration, what you need most is a real *line* of equipment to work with.

That's why Ice-O-Matic commercial refrigeration is admitted, among the men in the field, to be the most nearly ideal franchise in the industry.

Ice-O-Matic is not only fine, precision-engineered equipment, but the Ice-O-Matic line is so complete in every detail, that it fits every commercial refrigeration need with utmost exactness.

Markets, florists, confectioners, delicatessens, of every size, as well as any kind of specialized refrigeration need, can be literally "tailored-to-measure." Maximum economy and efficiency is thus guaranteeable.

Send the coupon for full franchise details.

WILLIAMS OIL-O-MATIC HEATING CORP., Bloomington, Ill.

Progressive merchandising overlooks nothing that contributes to lowered overhead and greater efficiency. Kroger Grocery and Baking Company store at Pekin, Ill., is one of many equipped with Ice-O-Matic Refrigeration. Two 12-foot (3-glass) top display cases and a 10 x 10 x 8 walk-in cooler are easily handled by the single Model FAW Ice-O-Matic compressor unit. Installed December 9, 1932.

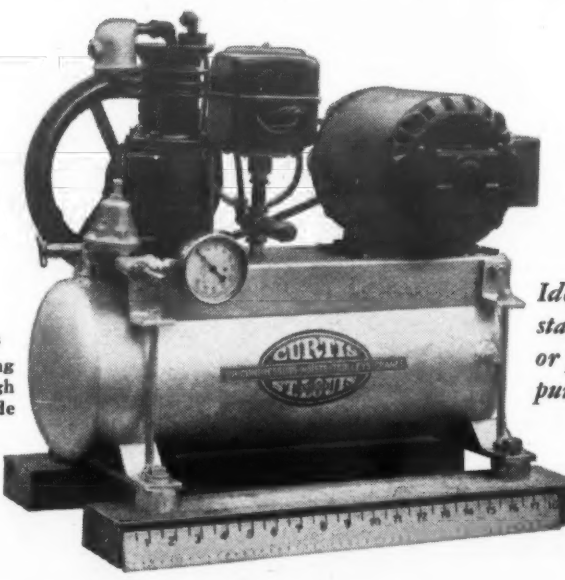
Ice-O-Matic compressors are now built in eight different sizes: ¼ horsepower, ⅓ horsepower, ½ horsepower, ¾ horsepower, 1 horsepower 1½ horsepower, and the new 2 and 3 horsepower, 4-cylinder models.

WILLIAMS ICE-O-MATIC REFRIGERATION

WILLIAMS OIL-O-MATIC HEATING CORPORATION R.N.4
Bloomington, Illinois
Gentlemen:
Please send me full details regarding Ice-O-Matic Commercial Refrigeration.
Name.....
Address.....
City..... State.....
Business.....

Beer Pumps

(*Completely Automatic*)



Overall Dimensions
20 1/8" long
18 1/4" high
12 1/4" wide

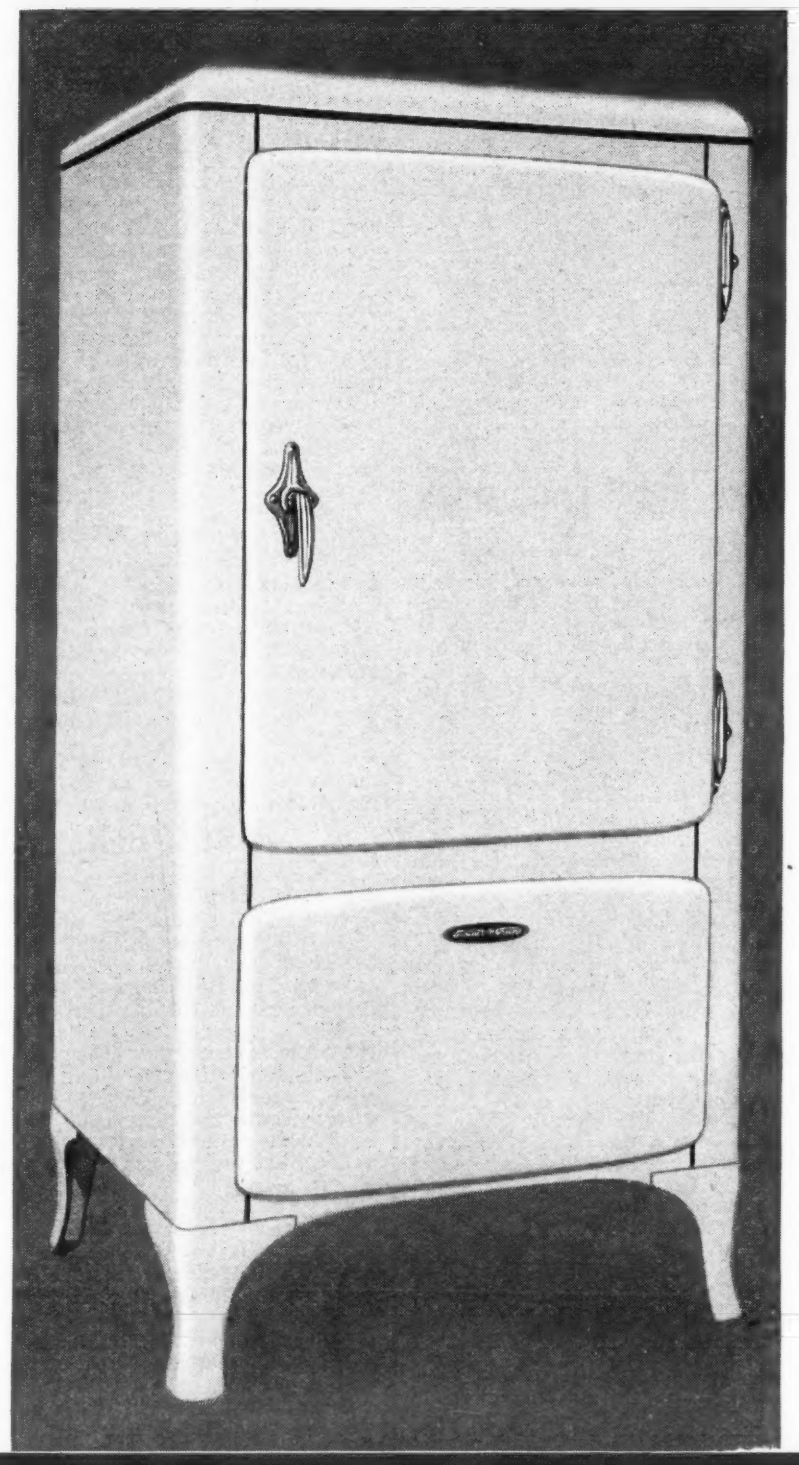
Ideal for stationary or portable pumps

Attractively Priced
—Prompt Delivery

TELEGRAPH OR WRITE

CURTIS PNEUMATIC MACHINERY CO.
1912 Kienlen Avenue Saint Louis, U.S.A.
79th Year

LESS "BLUE SKY".... MORE "LONG GREEN"



HERE'S A REFRIGERATOR PROPOSITION THAT REALLY OFFERS SOMETHING

1 OUTSTANDING, UP-TO-THE-MINUTE MERCHANDISE—Not SOME of the latest features, but ALL of them—plus many more. 100% designed and built by Stewart-Warner. Attractive prices—and profit-making discounts.

— PLUS —

2 A BUILT-FOR-THE-DEALER SALES PLAN—and a most outstanding Finance Plan.

HERE'S SOMETHING WORTH INVESTIGATING . . . *get the facts*

LET'S GET DOWN TO COLD FACTS. Almost 800,000 electric refrigerators sold last year—over 16,000 dealers in the field—but mighty few of them paid an excess profit tax on their year's business.

Estimates show about the same volume for this year. Are you going to just get by—or do you want to make a real profit? If so, side-step the Arabian Nights tales, and get the facts on a refrigerator backed by a plan that is geared to your actual operations.

For 12 months we have studied the dealer's problems—what he had to do in order to make his refrigeration department profitable. For 12 months our engineers have worked on a 1933 line that would give him the merchandise—as women wanted it—at a price they would willingly pay.

The result is a new line of boxes, with new features, and every new improvement; a "point of sale" merchandising plan built up, not by arm chair theorists but by practical men experienced in the field.

—And a dealer discount set-up, based on a working knowledge of his operating costs and profit needs.

Back of it all is a remarkable Finance Plan that permits an unlimited volume of time payment sales—a vital essential to maximum profits in a business where *90% of all sales are made on the "easy payment" plan.*

OUTSTANDING DEALER RETAIL FINANCE PLAN

With such a "set-up"—on a refrigerator that is a stand-out in attraction, convenience and performance—your efforts this year will be repaid with "Long Green" instead of "Blue Sky." Coupon will bring you details of this profit plan.

LOOK AT ALL THESE FEATURES

Two-Cylinder, Vibrationless Compressor
Built for trouble-free, lifetime operation.

Latest Type Pull-Out Shelves
Fully adjustable to any spacing.
Ribbon-type. Rust-proof finish.

Newest Type Defroster
Refrigerates while defrosting.

12-Point Cold Regulator
Better regulation—faster freezing.

Compact Freezing Unit
Leaving more space for food.
Enclosed—no absorption of odors.

Plenty of Ice Cubes
Providing ice in abundance.

Special Double Depth Tray
For freezing desserts.

Automatic Interior Light
Built-in—uses standard socket bulb.

All Porcelain Interiors
Rounded corners for easy cleaning.

New Stream-Line Design
Simple, modern, smart.

Modern Chromium Hardware
Newest, semi-concealed hinges.
Invisible latch with finger-touch release.

PLUS MARVELOUS NEW, FORCE-FEED, CHILLED OIL LUBRICATION SYSTEM—STEWART-WARNER'S LATEST DEVELOPMENT

STEWART·WARNER

Electric

REFRIGERATORS

STEWART-WARNER CORPORATION ERN-4
1826 Diversey Parkway, Chicago

Send me the facts on your 1933 Electric Refrigerator Set-up.

Name_____

Address_____

City_____ State_____

BEER COOLING

Frigidaire Equipment Will Cool from 3½ to 50 Gals. of Beer an Hour

(Concluded from Page 1, Column 1)

pacities ranging from 3½ to 50 gallons per hour, and is designed to meet state and municipal codes which will probably be passed to govern the dispensing of beer.

Models TT-12CC and TT-4C, largest in the line, employ a secondary refrigerant sealed in an insulated tank. Beer flows through a continuous coil of block tin tubing immersed in the secondary refrigerant, causing the refrigerant to vaporize and the beer to be cooled. Vaporized refrigerant is condensed on the primary refrigerant coils above in the same tank, and falls back as a liquid to the bottom of the tank.

Model TT-12CC has two beer coils, and is housed in a square, insulated casing 30 in. high, 12¼ in. deep, and 14¼ in. wide. This model weighs 140 lbs. Capacities, dependent upon precooling temperatures and the size of condensing unit installed, range to 25 gallons per hour from 60° to 40° F., or 50 gallons per hour from 50° to 40° F for model TT-12CC.

The smaller model, TT-4C, will cool 27 gallons of beer per hour from 50° to 40° F., or 15 gallons per hour from 60° to 40° F. TT-4C is 11¼ in. wide, 22 in. high, and 10¼ in. deep., and has a net weight of 70 lbs.

The exterior casing of the new coolers is hot-galvanized sheet steel, while the tank has a brass electro-tin head and electro-tin plated head. The primary refrigerant cycle is controlled by an expansion valve, whereas a pressure regulating valve controls the temperature in the tank. The tank is provided with a fusible safety plug. All control valves are protected within the outer casing.

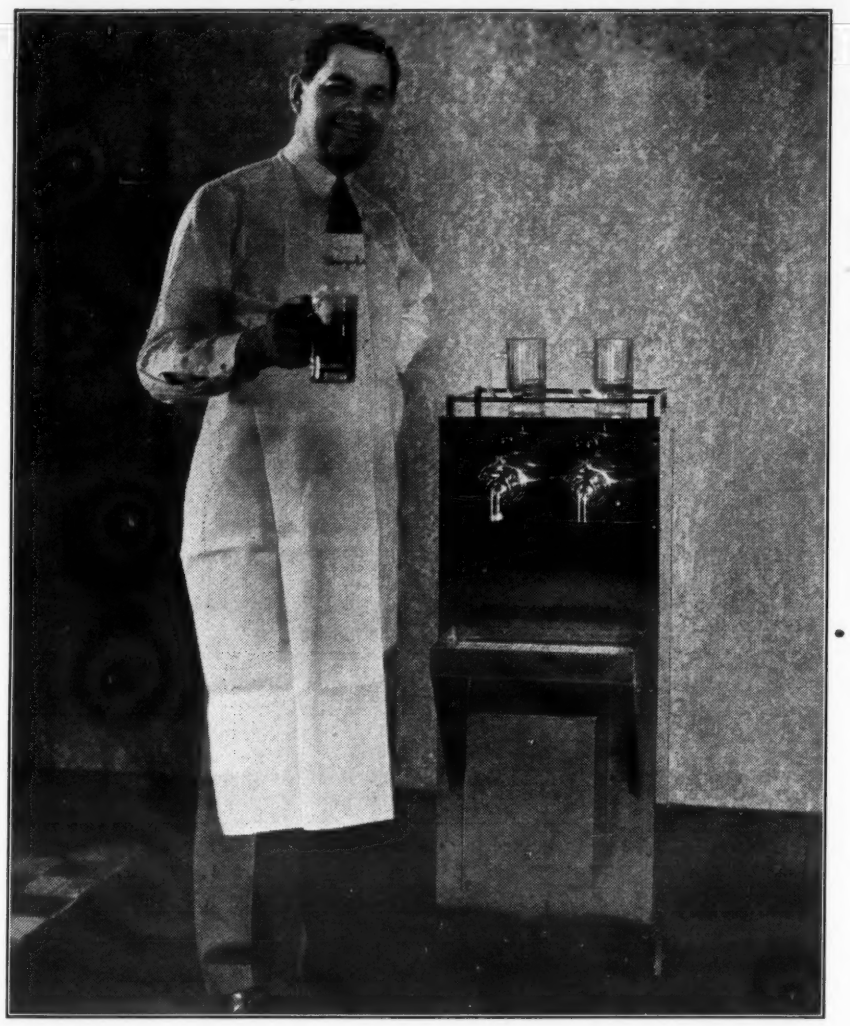
The front, back, and bottom of the coolers are insulated with 2 in. of rock cork, the sides with 3 in. of rock cork, while the top is sealed with hot asphalt.

By providing a small auxiliary tank to hold the secondary refrigerant while the beer-cooling coils are being cleaned, Frigidaire engineers claim to have reduced the cleaning operation materially. Cold beer can be drawn from the coils within three minutes after cleaning, regardless of whether hot steam or cleaning solutions are used, they claim.

By using the secondary refrigerant principle, it is not necessary to pump down the refrigerant in the primary system during cleaning operations, according to the announcement.

Production of beer-cooling equipment has been under way for more than two weeks, and shipments have already been made to distribution centers.

New Frigidaire Beer Cooler



C. E. Quigley, Frigidaire's beer-cooling division head, with a new product.

TEMPRITE BEER COOLERS »

meet every modern dispensing demand

. . . Efficiently . . . Economically . . .

TEMPRITE»
COOLS BEER INSTANTLY

Direct Heat Transfer—the exclusive engineering principle employed in the design of Temprite, provides INSTANT cooling of BEER as it passes through the coil, for the heat in the BEER is transferred DIRECTLY to the liquid refrigerant in which the beer coil is immersed. . . Due to the super-efficiency of this patented method of cooling, Temprites are of exceptionally small sizes permitting installation immediately adjacent to the faucets.

CONTROLS THE TEMPERATURE
Automatically—Positively—Accurately

Temprite's Positive Control of draft temperature is of equal importance to its instantaneous cooling, since BEER to be most appetizing, should be served at 40 degrees whether a single glass or a score of glasses are drawn in rotation. . . Temprite's special control valve accomplishes this perfectly since any temperature setting may be made to meet the dispenser's local demand and such temperature maintained indefinitely, whether one or one-thousand glasses are drawn.

GOVERNS THE FOAM

The texture and depth of foam in the glass can be definitely governed when the Temprite is employed for cooling, due to the fact that BEER is conducted through coils, which are constructed of seamless tubing of correct length and diameter—And since Temprite cools instantly as BEER is drawn, separation of gas and liquid prevalent in storage systems, is positively eliminated.

Adaptable to New or Existing Fixtures

LIQUID COOLER CORPORATION
DETROIT MICHIGAN

Write for Catalog

DIREX USES TEMPRITES IN NEW BEER EQUIPMENT

CHICAGO — Equipped with Temprite beverage coolers and electric refrigeration, a new line of beer storage, cooling, and serving equipment is being introduced by the Direx Corp. here.

The line includes three sizes of coil boxes, and five models of beer dispensing units, according to the manufacturer. Model K-1 is a portable eight-gallon dispenser only, designed for room service.

One of the coil boxes is 40 in. high, 30 in. deep, and 78 in. wide. It is insulated with Celotex, has a stainless steel exterior. Another has the same dimensions and features, but has a porcelain exterior. The third model is 40 in. high, 30 in. deep, and 20 in. wide, and is available with either a porcelain or stainless steel exterior.

All of the three models are designed for use with a ½-hp. compressor. Tops of these units are of 20-gauge stainless steel, and all faucets are chromium plated.

The Direx model 2-P unit is equipped with a three-faucet (one for water) coil box, and a double-door cabinet for beer storage, top of which may be used as the bar counter.

Models BC-12 and BC-3 are portable, self-contained combination barrel and bottle coolers, the first having a capacity of ⅛ barrel of draft beer and 12 doz. bottles, the second having space for ½ barrel of draft beer and three dozen bottles. Each of these units is equipped with a single draft arm.

With each model of the dispensing units, CO_2 pressure apparatus is supplied, and all models are equipped with barrel skids which make possible the changing of barrels without lifting.

Where floor space is limited, the dispensing units may be installed on the main floor, and the beer tapped to them from the basement.

Liquid Cooler Rents Additional Space

DETROIT — Liquid Cooler Corp., manufacturer of Temprite beverage coolers here, has taken over the fourth floor of the Milwaukee street building to which it moved recently, and is equipping the new space as a final assembly and test department preparatory to a step-up in its cooler production.

The organization this week is mailing copies of a new Liquid Cooler catalog which carries complete descriptions and specifications of the entire Temprite line, according to P. Fred Lesley, general manager of the company.

McCRAY DESIGNS COOLERS FOR BEER

KENDALLVILLE, Ind. — McCray Refrigerator Sales Corp. has designed a number of new units for cooling both draft and bottled beer, and is offering walk-in coolers for the storage of barreled beer. The draft beer coolers are equipped with two faucets, each with a capacity of 60 12-oz. glasses per hour.

COMMERCIAL BUILDS DRAFT BEER CABINET

LOS ANGELES—Commercial Refrigerator Mfg. Co., Ltd., local manufacturer of commercial refrigerators, has just announced a new draft beer-cooling cabinet, equipped with a ¼-hp. refrigerating machine. The outfit is priced at $370 f.o.b. factory here.

The cooler is built in two sections, one with a lower compartment to house the refrigerating machine and an upper compartment with space for 72 pint bottles, and a second larger section which accommodates two half barrels of beer and has facilities for serving from two draft-arms. Sides and top of the cabinet are finished in mahogany. Dimensions are: height 40½ in., depth 27 in., and length 80 in. Complete equipment weighs 650 lbs.

The dispensing cabinet is provided with a heavy-duty evaporator and brine tank, the draft beer being refrigerated by two block tin coils. The cabinet is lined with metal. Control of the system is centered in a thermostatic expansion valve. The company also has other beer-cooling equipment in single and double barrel capacities.

GOVERNOR DEBATES WITH BREWERS ON BEER PRICE

DETROIT—While Michigan's governor, William A. Comstock, is insisting that an eight-oz. glass of beer can be profitably sold for five cents in the state if his proposed beer bill is passed in toto, Detroit's old-time brewers disagree with him to a man. The price will have to be 10 cents for a 10-oz. glass, they insist.

As reason for their opinions, the brewers explain that in pre-prohibition days, a 31-gal. barrel of beer cost a retailer from $7 to $9, including a $1 federal tax. There was no state tax.

$16 a Barrel in St. Louis

In St. Louis Anheuser-Busch, Inc., and Falstaff Corp. have announced prices to retailers of $16 a barrel, and the brewers here believe that this price will be set by practically all brewers in the country.

In addition to this initial cost, Michigan retailers will be obliged to pay a $1.25-per-barrel state tax if Gov. Comstock's bill is passed, which will make the cost per barrel approximately double what it was before 1920.

400 10-oz. Glasses

From each barrel, approximately 400 10-oz. glasses of beer can be drawn, which means that in the old days the beer in each barrel retailed for about $20, Now, with the *wholesale* price of beer boosted to double its former cost, the beverage must be *retailed* for twice its onetime price, the brewers declare.

They admit that it might be possible to serve a six-oz. glass of beer for five cents, but they argue that persons who genuinely like their beer would be loath to consider a six-oz. shell a *glass.*

Case Sells for $2.25

The two large St. Louis breweries have set the price on bottled beer at $2.25 for 24 12-oz. bottles, which leads local *braumeisters* to believe that dispensaries will sell the bottled refreshment at 15 cents per bottle, netting $1.35 a case.

Several retailers in this country were disappointed just recently when the orders they placed for beer with Canadian breweries were rejected.

Dominion brewers say they do not intend to make any 3.2 per cent brew, even though some American buyers are willing to pay the high import tax to secure the Canadian beverage.

Superior Builds Draft Beer Dispensers

ST. LOUIS—Announcement has just been made of a new draft beer dispenser of the Superior Refrigerator Co. G. G. Gruendler, Jr., director of sales, explains that the new dispenser accommodates two half-barrels of beer, and is equipped with faucets, tubing, air and beer hose, pressure gauge, valves, etc. for electric refrigeration. The company also builds a line of coolers for storing barreled beer in basements, Mr. Gruendler states.

COPELAND REPORTS ORDERS FOR BEER COOLING

MT. CLEMENS, Mich. — Copeland Products, Inc., has already felt the demand for commercial refrigerating machines for beer cooling, Harry Newcomb, commercial sales manager, states.

Visiting the factory last week Frank Rose of the Essex Distributing Co., Copeland distributors at Newark, N. J., reported that they are already making installations for cooling beer for retail sales, with many additional installations in prospect.

Here's the PACEMAKER for '33!

COPELAND

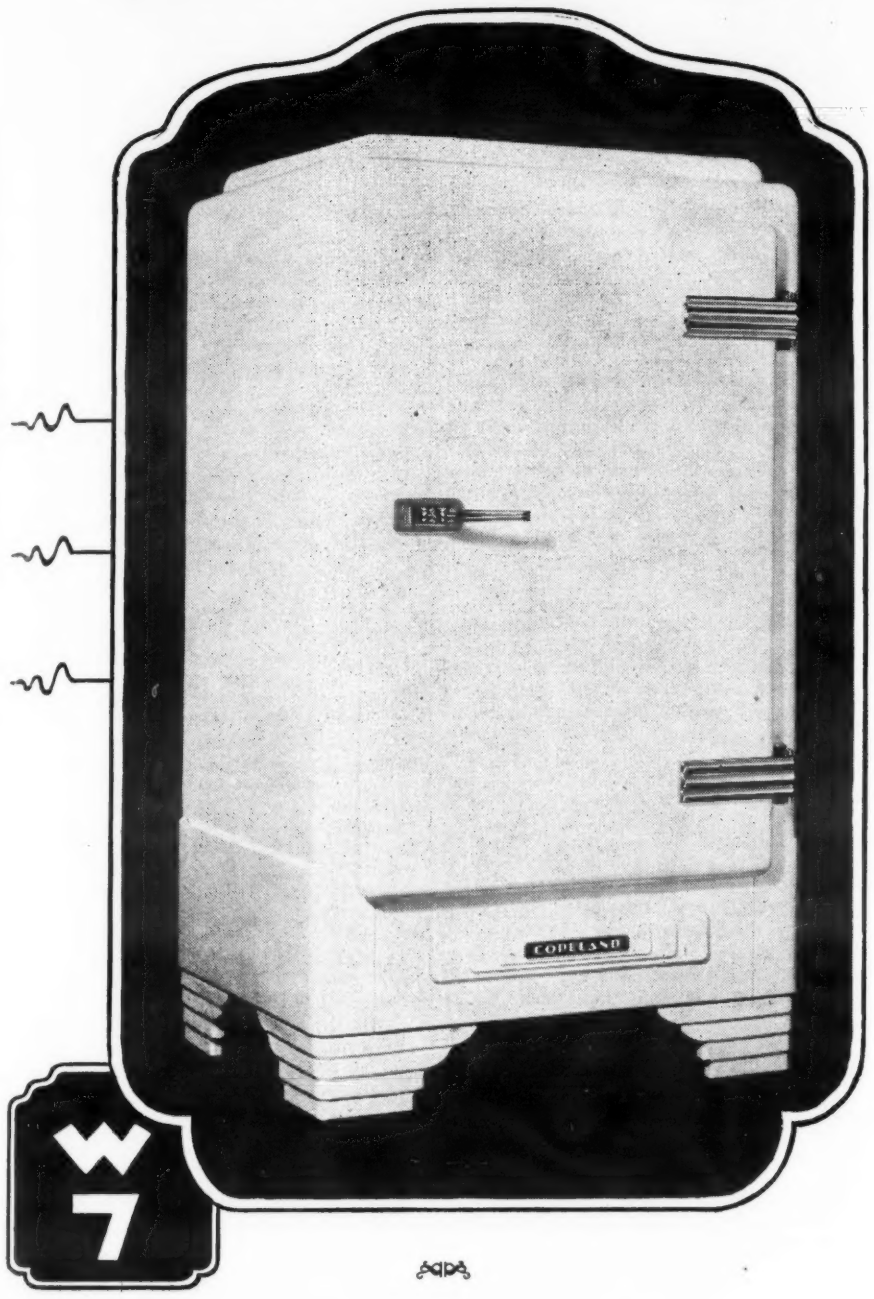
with a

NEW STYLE SUPREMACY!

NEW MECHANICAL PERFECTION!

NEW LOW IN PRICES!

and a new high in dealer net profits!



Copeland's sales franchise assures immediate profits for you without heavy investment or increased overhead.

Copeland's new mechanism positively wipes out dealers' service problems and resultant expenses.

Copeland's new beauty, styled for greater sales appeal, absolutely compels buying desire.

It's a brand new refrigerator, but it's backed by an old established company.

FOR COMPLETE INFORMATION REGARDING THIS NEW LINE AND NEW DEALER FRANCHISE

MAIL THIS **COUPON Today!**

COPELAND, Mt. Clemens, Mich.

Gentlemen:

I want to know all about the 1933 Copeland.
I have handled the following refrigerators:

.....

NAME .....

NAME OF FIRM .....

ADDRESS .....

It's a line that will assure volume because it fits every requirement from beauty to price!

It's a line that will make a new high in net profits for you because it licks service losses!

It's a line destined to add another enviable chapter to Copeland's fine record of dependable performances in better electric refrigeration service.

In the new Copeland for 1933 is the new, unrivalled Copeland mechanism, the 74 pound cartridge unit that has only three moving parts. This new unit has whipped the service calls, the heretofore profit shrinker in retail refrigerator selling. A simplified service problem that parallels the automobile "loaner" battery has been applied to the electric refrigeration business and this is what means profits to you.

Realizing clearly that dealers who have the Copeland line will be called upon to meet low price competition, Copeland has in the 1933 line, three models that will knock competition into a cocked hat. A four, five and six cubic foot size at the lowest price at which such a quality electric refrigerator has ever been offered.

Copeland quality is built into every one of these new low price models. They stack up with the best in the market. Over 14 years of engineering experience and pioneering is reflected in the mechanical improvements and design of these new Copelands.

Summing it all up: you have Beauty and Low Price with Mechanical Perfection throughout, and greater volume possibilities with less sales resistance at bigger net profits assured from Copeland's new service eliminated construction and franchise policy.

Priced from $96 up

FEDERAL TAX PAID — FREIGHT TO BE ADDED

ELECTRIC REFRIGERATION NEWS

The Newspaper of the Industry

Published Every Week by

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Selling Air Conditioning

AIR CONDITIONING, like television, hasn't caught up with its publicity. Engineering is still in the incubator stage, volume production thus far has been almost negligible, and not until quite recently have any organized selling plans been proposed.

That a market is there nobody seems to question. In fact, several markets. And few industries have started out with the advantage— or disadvantage—of so much advance ballyhoo. But thus far there has been little agreement as to just what constitutes air conditioning, and even less concurrence—until this year—on methods of selling comfort cooling devices now on the market.

Sales Plans Revised Through Research

In 1933, however, several manufacturers of air-conditioning equipment are prepared to push their way into the market with phalanxes of carefully evolved sales presentations. Selling methods on these new specialty products have been revised in the light of field experience and the results of consumer research, so that today the comfort-cooling salesman not only has at his disposal adequate material, but is provided with a series of specialized presentations designed to fit the particular cases on which he is working. What's more, these presentations are now practical rather than theoretical.

Study of the market has shown manufacturers that it is quite definitely divided into four classifications, namely:

Four Market Classifications:

1. The personal comfort market—comprised chiefly of homes in which air-conditioning equipment is installed solely for personal comfort of the owners.

2. The comfort-for-profit market—made up of stores, markets, restaurants and other business establishments, owners of which might install air conditioning for the comfort of patrons.

3. The efficiency market—offices and plants wherein air-conditioning apparatus is placed to increase the efficiency of workers.

4. The industrial market—factories, laboratories, etc., where controlled temperature and humidity, air cleanliness, and proper ventilation are essential for manufacture of certain products.

Personal Comfort Market Small

In No. 1, the personal comfort market, air-conditioning manufacturers see but slight opportunity for a good volume of sales this year. With economic conditions as they are today, few people will be willing to spend a sizable sum of money merely for their personal comfort, the manufacturers think.

It is not expected that No. 4, the industrial market, can be depended upon for any great amount of business, since many established plants requiring air conditioning for production processes are already equipped with air conditioning, and construction of new factories will probably be quite limited. Some breweries, however, may be in the market for new air-conditioning equipment.

But in Nos. 2 and 3, manufacturers see what they believe are their best opportunities for 1933, especially for equipment which cools, dehumidifies, cleans, and circulates the air. Regarding the comfort-for-profit market, they point out that because many mercantile establishments are at least slightly strained financially today, their proprietors will—if properly approached—be willing to listen to the presentation of salesmen who offer something to increase the number of patrons visiting their places of business, and so boost profits.

Increase Efficiency of Office Workers

Likewise, the comfort-for-efficiency market offers a good field for aggressive air-conditioning salesmanship this year, manufacturers are telling their outlets. Many a company which employs a number of office workers will, regardless of the times, probably give serious consideration to purchase of equipment which will help maintain the efficiency of heat-dulled clerks, accountants, and stenographers.

Air-conditioning manufacturers are not, however, limiting their 1933 sales preparations to mere market analysis. They are devoting much time to teaching salesmen how to *sell* prospects after *finding* them. In the past, most air-conditioning sales outlets made no great effort to train their salesmen further than giving them a course in the principles of air conditioning, its general benefits, and mechanics of the equipment.

Any salesman who has been schooled in these phases of air conditioning was permitted to contact home owners, merchants, and office executives; and sales presentation given these various types of prospects was much the same for all classifications.

Presentations Vary With Prospects

Sales executives realize now that there is a vast difference in the type of presentation needed to close sales with each of these prospect groups. Some features of air conditioning which might be used as the most important part of a sales talk to a home owner are of little importance in talking to a restaurant owner, and vice versa. An office executive is only slightly interested in points regarding air conditioning which might be of great interest to a bookshop owner.

Realization of these facts is leading some manufacturers to advocate specialization within the ranks of air-conditioning departments in large retail outlets. They suggest that some men concentrate their efforts on the residence market, while others devote their time chiefly to the comfort-for-profit market, etc.

Better Opportunity for Profits

To air-conditioning sales departments in smaller cities, where the limited number of salesmen available does not permit much specialization, manufacturers are supplying training materials which point out clearly that one type of presentation is not suitable for all prospects, and which give basic points for use in sales talks to varied types of prospective buyers.

New and speedier methods of estimating have also been developed. All in all, the distributor of air comfort cooling equipment is in much better position to earn profits on his franchise this year than he ever has been before. And at that, the air-conditioning industry, like John Paul Jones, has not yet begun to fight.

Notice

Extra copies of the March 22 issue of ELECTRIC REFRIGERATION NEWS, containing detailed specifications of 273 household refrigerators made by 35 manufacturers, are available at 10 cents per copy. Please send cash or stamps with your order.

New subscribers who would like to start with the Specifications Issue (and old subscribers who failed to renew in time to receive this data) may take advantage of the "Special Offer" on page 20 of this paper. For $2.00 you will receive 41 issues of ELECTRIC REFRIGERATION NEWS (March 22 to Dec. 31, 1933).

Readers interested in specifications of *commercial* refrigerating equipment may obtain complete information covering all important makes by subscribing to REFRIGERATED FOOD NEWS (issued monthly). Simply add 50 cents to the remittance and request that subscription be started with the February, 1933 issue. This paper is $1.00 per year when ordered separately.

LETTERS

'Nailed to the Floor Merchandising'

Grigsby-Grunow Co., Inc.
Chicago
April 7, 1933.

Editor:

I read with interest, but "view with alarm," your editorial of April 5 headed: "New Products vs. Left-Overs."

One would get the impression from reading this editorial that the refrigeration industry has a lot of repossessions as well as a lot of "left-over" merchandise. Both of us agree, I am sure, that conditions are really not as bad as that.

What you should have said in this editorial,—and, perhaps, what you ought to use as the basis of your next editorial—is: "NAILED TO THE FLOOR REFRIGERATOR MERCHANDISING MUST STOP!"

Most of the refrigerators that you see advertised in metropolitan papers around the country at $39.50 are "nailed to the floor" models. Any merchant can have such models on hand, and I am afraid too many will unless we start a little propaganda and do some educational work. You know the scheme, of course. They pick up or repossess an old refrigerator or two—give it a little "elbow polish"—set it on the floor and use the job for "bait" advertising. When a customer comes in to look at the $35.00 model, he is told that "it's a swell refrigerator," but that it does not work very well, and the "old step-up" starts.

When most merchants conduct their advertising legitimately this "gyp" type merchandising has a decided advantage and the advertising "pulls" people into the store; but when the practice becomes more universal the "pull," therefore, becomes less. The net result would be, if more and more merchants went in for "gyp" advertising, a demoralized condition in the market and a complete lack of faith on the part of the public in refrigerator advertising.

It would seem to me, therefore, that here is a great opportunity for ELECTRIC REFRIGERATION NEWS to start a clean-up crusade on refrigerator advertising. As the leading refrigerator trade paper, the industry would be glad, I am sure, to follow your leadership.

HARRY ALTER,
Assistant general sales manager.

Grave Injustice

C. L. Fuller
Ionia, Mich.
April 5, 1933.

Editor:

During these times of stress it would seem you have done a grave injustice to the Copeland Refrigerator Co. in your article of March 29. Stories of this kind are better never published, or at least not until after there is no hope left, or new reconstruction effected. That is partly the trouble with the banks today—undue haste in starting stories which grew in telling and resulted in unnecessary withdrawals which naturally crippled otherwise normally secure institutions. Premature news does harm which in this case will probably take years to overcome.

Wouldn't it be better to publish constructive news during these times? We may all need a little help before the summer is over, in which case we wouldn't want it published to the four corners of the world, making bad matters worse.

C. L. FULLER.

Southern Models

Electrical Equipment Co. of Arizona
424 N. Central Ave., Phoenix, Ariz.
March 28, 1933.

Editor:

May we please call to your attention the compressor specifications on Kelvinator as given in your March 22 issue of the ELECTRIC REFRIGERATION NEWS.

We believe you have errored in giving the compressor specifications as to ice melting capacity on models K-80, PK-80, D-55, D-65, D-75, D-90, and D-120. You have also left out the specifications on Kelvinator's senior models which are used entirely in our territory, and for your information we refer you to your Supplement and REFRIGERATION DIRECTORY and MARKET DATA BOOK issued Oct. 30, 1932, pages S-82 and page S-83, where you have given the correct information.

We are Kelvinator distributors for Arizona and the information given in your issue of March 22 will be a great handicap to us, and we would appreciate a corrected list of specifications in an early issue.

Kelvinators which we stock and sell in this territory are 187 pounds ice melting capacity on all the 5,- 6-, 7-, and 8-ft. boxes, and 112-8/10 pounds on all the 4-ft. boxes.

M. C. JENNINGS.

Uniflow Guarantee

Uniflow Mfg. Co.
Erie, Pa.
March 17, 1933.

Editor:

In reading March 15 issue under guarantee tabulations, first page, I notice you have listed our last year's models with three-year guarantee. I hasten to correct this.

Our guarantee this year, 1933, will be for one year on all models. Challenger models are TS-40, TS-45, S-45 and S-60. Lectrik-Ice models bear the same numbers as last year.

We are pleased to state that something has taken place to start buying. All of us are familiar with what has happened to cause this. We are running nearly full time and full force to get out orders ahead of us just received recently. The banishment of fear on the part of the public may be the signal for a real refrigeration year in 1933.

C. A. KUEBLER,
President.

Guarantees

Bankers Commercial Security Co., Inc.
270 Madison Ave., New York City
March 31, 1933.

Editor:

A problem has come up where we would appreciate your assistance if you are in a position to advise us or, if not, we hope that you will be able to refer us to the proper authority. In our business of purchasing contracts covering electric refrigerators from distributors and dealers, it happens rather too frequently that the distributor or dealer goes out of the picture and, consequently, our ability to collect out the remaining instalments on the contracts successfully depends, to some extent, on our ability to render service to the customer.

Fortunately, we have had but one experience where the manufacturer will not back up his guarantee of three years on parts and service. Our problem is to find out whether there are other manufacturers who will not back up their guarantees in cases where the distributor and/or dealer are no longer in business or have discontinued handling that manufacturer's line. If you are in a position to advise us as to the general procedure, in such cases, or where this information could be obtained, it would be greatly appreciated.

W. R. BENTLEY.

Answer:

April 4, 1933.

Practically the only electric refrigerator now manufactured which carries a long guarantee is the General Electric hermetically sealed refrigerating machine, with which the customer is given a four-year free service contract. The General Electric Co., of course, backs up this guarantee on all of its hermetically sealed refrigerating machines, even though the distributor or dealer who sold the machine has passed out of the picture.

There are, however, hundreds of thousands of electric refrigerators of other makes which were sold with three-year guarantees, and on which the guarantee period is still running. Some of these refrigerators were sold under three-year guarantees by manufacturers who are now no longer in business. On such machines there is no recourse.

All refrigerators sold by responsible manufacturers now in business, however, will be fully protected during the length of their guarantee period by the manufacturer, we understand.

In localities where a distributor or dealer has quit the business or taken on a new line, the manufacturer usually assumes responsibility until such time as a new distributor or dealer is appointed. The new distributor or dealer then assumes the obligations of the guaranteed refrigerators sold by his predecessor.

The common practice among the substantial manufacturers for handling three-year guarantees was to set up a reserve fund, divided into three parts, for each refrigerator manufactured and sold. First portion of this fund was rebated to the distributor when he purchased the machine. Second instalment was sent to him at the beginning of the second year of the guarantee period, and he was paid the remainder upon the beginning of the third guarantee year. Thus the distributor was provided at the beginning of each guarantee year with a sum of money to take care of service difficulties which might be encountered on that machine during the year.

Finances

George Brown & Co., Ltd.
Electrical & Industrial Engineers
267 Clarence St., Sydney, N. S. W.
March 10, 1933.

Editor:

I trust that the financial affairs of the U. S. A. will shortly be straightened out and that you will not suffer any losses; for your newspaper does much to consolidate the interests of the refrigeration industry the world over, and is highly valued by each and every subscriber.

F. C. LOVELOCK.

An Editor on Wheels

Stories of Interesting PLACES in the Refrigeration Industry

By **GEORGE F. TAUBENECK**

New York City

China has been conquered and reconquered; yet it has remained China for centuries and centuries. The conquerors simply become Chinamen. Similarly, New York. Every year its Babelonian (Babylonian, too, possibly) towers and fortresses are stormed by eager youths and confident veterans—all set to take the turn. Result: they become New Yorkers.

Although it may be chiefly these Young Lochinvars Come Out of the West who do capture the city, it is a rare conqueror who is not himself, in turn, taken in by New York. He may gain, to his way of thinking, the world; yet he loses his own soul.

It takes a mighty spirit to swallow to obliteratingly such a flood of talent as pours into New York. And it is a mighty spirit. It dictates to the rest of America what hats its women shall wear, what lengths of hosiery and hair shall be visible, what books shall be read each month, what plays should be seen, what songs should be whistled, what incomprehensible artists should be salaamed, what slang should be introduced into its speech.

That the rest of the nation resents this dictatorship was apparent especially a few years ago, when the prohibition fight was the most bitter. There was even wild talk in Middle West small-town circles a few years back of sending armed forces into Gotham to correct its supposedly reprehensible morals.

Since 1929, however, New York's so-called "fast life" has calmed down a bit. Moreover, the universal desire for change bred by the depression has possibly led a great portion of the nation around to New York's way of thinking in regard to beer. At any rate, the bitterness and resentment toward and distrust of New York City has subsided somewhat. Not dead, however; just smoldering.

* * *

Toledo, Ohio

Toledo is not a beautiful city. Save for the Museum of Art (what industrial city doesn't have have one?—and what industrial city honestly appreciates the one it has?—apparently they are put up by workings of a mass inferiority complex, or by the same sense of duty that prompts men who are skeptical at heart to drop silver dollars in the collection basket) and the University of the City of Toledo, a self-respecting architect would be as unhappy wandering Toledo's streets as a genuine musician forced to listen to a rehearsal of the Sixth Grade Pupils Violin Choir.

Lest this sound like bitter criticism, let us hasten to interject that Toledo does not need beauty as an excuse for being. Toledo builds automobiles, automotive products, children's vehicles, canvas goods, fountain pens, springless scales, presses, and dies. Toledo handles grain, distributes spices, collects and sells winter vegetables, markets clover seed. It "fills its niche and accomplishes its task."

Toledo is a city of and for workers. No, or few, fancy frills. It lives and works on a *lean* basis. It is frugal. It has not discounted the future beyond all reason. It has refused to indulge in fanciful ideas of The New Era. And in this year A. D. 1933, Toledo may have right to be proud of its consistently negative attitude toward extravagance.

Nearly 300 years ago Toledo had its beginning when the French adventurers and entrepeneurs pushed through the Maumee valley in their blazing of the westward trail. Ever since that time Toledo has been a port of call, a refueling station. From the explorer's cache to the site of extensive warehouses for national distributing organizations has been a logical and orderly development for this water, land, and air transportation center.

Toledo was incorporated in 1837. Its population now runs somewhere between 250,000 and 300,000. It considers itself the third largest railroad city in the United States, and the third largest city in Ohio—a state which is so honeycombed with cities that a motorist scarcely leaves one before he approaches the environs of another, and an air pilot is rarely out of sight of one.

Living simply, owning their own homes (close to 50 per cent of all Toledo families have no landlords), obtaining their recreation from municipal parks, playgrounds, swimming pools, beaches, golf courses, professional baseball games, horse racing, and the country's second largest free zoo, the citizens make no pretense at enjoying the gilt-edge, "sophisticated" type of pleasures and style of life.

Society? There probably isn't a lorgnette or a Pomeranian in the city. Pseudo-culture? Bunk. There are some genuine treasures in the Museum of Art—the fine collection of paintings from the French Barbizonian school, the unparalleled collection of ancient and modern glass, the collection of early efforts at publishing—but there is no element in the city which might in any sense of the word be termed "arty."

Talk about industry, however, and Toledoans begin to shine conversationally. They have the *feel* of industry, not just a vague acquaintance with it.

Oil, for instance. Let a native discuss the *modus operandi* of the Gulf Refining Co., or Sun Oil, Standard Oil, Pure Oil, Craig Oil. You'll learn something. Maybe two things, or three.

Start him talking about the Libbey-Owens-Ford glass plant (better still, go out and see it for yourself). Let him tell you about such automotive suppliers as Spicer (universal joints and heavy duty transmissions), De Vilbiss (spray-paining equipment—also atomizers and perfuming devices), Electric Auto-Lite (ignition), Chevrolet (transmissions and gears), Mather Spring (nickle plated bumpers), Champion Spark Plug, Toledo Machine and Tool, Acklin Stamping, and other important manufacturers. You will find Mr. Toledo-Man-in-the-Street as well informed as every New Yorker thinks he is about finance.

If you'll let him, he'll probably expand into discussions of Woolson spices, Willys-Overland automobiles, Toledo scales, Swartzbaugh electrical equipment, Riddle aluminum lighting fixtures, Airway vacuum cleaners, Conklin pens, Pinkerton's varieties of chewing tobacco (a logical site for a chewing tobacco company), National Milling Co. flour, Gendron children's wheels, and other products which have given Toledo sustenance and made it grow.

He can tell you all about Toledo's importance as a port on Lake Erie, and statisticate on the soft coal it receives and sends out. He can tell a story of the rise of John North Willys from automobile salesman to automobile manufacturer to ambassador and back again.

This conversational knowledge of industry is an important clue, for it shows what Toledo's citizens *think* about, and "as a man thinketh, so is he." Everything you see or hear in Toledo bears out your impression that this is a city which means business, and which disdains the tinsel and the fol-de-rols. It gets down to fundamentals.

Briefly put, Toledo's interest is in production, rather than consumption.

FOUR DISTRIBUTORS ARE APPOINTED BY LEONARD

DETROIT—The Leonard Refrigerator Co. has appointed four new distributors according to R. I. Petrie, general sales manager.

The Brown Distributing Co., 365 Glenn St., S. W., Atlanta, will handle Leonard electric refrigerators in a large portion of Georgia, Mr. Petrie said. J. C. Brown is president of the company.

The other southern appointment was made in Little Rock, Ark., with the naming of the Bush-Caldwell Co., as distributor. T. W. Bell heads the company's electric refrigeration operation.

Throughout northern Ohio, Leonard distribution will be taken care of by the Electric Range & Equipment Co., Toledo. J. L. Berry of this company signed the contract.

C. H. Lines Co., Inc., Washington & Harrison Sts., Fort Wayne, Ind., will distribute the company's products in northwestern Indiana counties and in two adjacent Ohio counties. C. H. Lines is president of the company.

Merriam Heads Drive To Modernize Homes

SCHENECTADY, N. Y.—A. Wayne Merriam, General Electric distributor here, will be in charge of the Modernize Schenectady Campaign to be sponsored by the local chamber of commerce during the spring months, according to John F. Horman, president of the organization.

Purpose of the drive is to bring about remodeling of homes and buildings in the city and suburbs, and thus provide work for many of the city's unemployed, says Mr. Horman.

BESSERMAN MOVES TO LARGER QUARTERS

NEW YORK CITY—Philip R. Besserman Co., Norge dealer here, has moved its salesrooms from 551 Fifth Ave. to larger quarters at 545 Fifth Ave., according to Philip R. Besserman, proprietor.

This company has taken on the Branford Roto-Flex oil burner line, and will serve as distributor for that product in metropolitan New York.

Mr. Besserman last week placed an order for 60 Norge refrigerators with Norge Corp. in Detroit, preparatory to opening his spring sales campaign.

SCHRAYER TO SELL COPELAND IN CHICAGO

MT. CLEMENS, Mich.—The appointment of Sydney V. Schrayer as distributor for the Copeland household refrigerator line in Chicago and Cook County, was announced last week by C. W. Hadden, general sales manager of Copeland Products, Inc.

For many years Mr. Schrayer has been identified with the sale of furniture, particularly to apartment houses and hotels, in Chicago. He will supplement his present line of business by including a department to handle sales to dealers in the Chicago area.

On Wednesday night, April 5, a sales meeting was held at the office and showroom of the Copeland Refrigeration Co. of Chicago. F. N. Pattison, manager of dealer development, Copeland Products, Inc., and L. H. Buhs, manager of the Copeland Refrigeration Co. of Chicago represented the factory at this meeting.

SEARS, ROEBUCK RETAIL BUSINESS GAINS

CHICAGO—Retail business of Sears, Roebuck & Co. in the large cities has begun to show improvement, but mail order sales still lag, due to the slower rate of reopenings of banks in small towns, according to a report made Friday by company officials.

GRUNOW DISTRIBUTOR ADDS THREE TO STAFF

GRAND RAPIDS, Mich.—Republic Distributing Co., Grunow distributor here, has appointed Frank Morrison, Leo Dagenais, and George Hepfinger to its wholesale sales organization, according to C. H. W. Merril, secretary.

Series of Schools On Commercial Units Closes

DAYTON, April 11.—Members of Frigidaire's commercial refrigeration selling forces have just completed schools in 36 key cities of the country at which the possibilities for commercial refrigeration sales were discussed.

More than 1,600 exclusive commercial salesmen attended, according to H. F. Lehman, commercial sales manager, under whose direction the schools were held.

The largest meeting was in New York City, which was attended by 236 men from the metropolitan New York, New Jersey, and Albany districts of Frigidaire Sales Corp.

Members of the faculty were: L. E. Smith, manager, sales engineering division; A. C. Frieman, W. C. Yates, V. A. Hetzel, D. C. McCoy, J. B. Breen, E. M. Powell, Elmer S. Rielly, commercial sales manager, Pacific region; C. B. Gamble; and M. A. Spayd.

FRIGIDAIRE GETS PROSPECTS BY WORD-OF-MOUTH

NEW YORK CITY—Word-of-mouth and national advertising, and mention of the 1933 Frigidaire line in the news columns of various publications brought large numbers of people to Frigidaire salesrooms here last week, according to Douglas R. Lawrence, manager of the sales planning division of Frigidaire Sales Corp. of New York.

"Our advertising in New York newspapers is not scheduled to break until April 11," said Mr. Lawrence last week, "yet we have had many visitors in our 16 company-owned showrooms and in department store outlets. In our Forty-Fifth St. showroom, crowds have been exceptionally large."

ATTENDANCE LARGE AT LEONARD SCHOOLS

DETROIT — Despite earthquakes, floods, bank holidays, and other disturbances that have cropped up during the last few weeks, attendance at the retail schools which the Leonard Refrigerator Co. is conducting for dealers and salesmen in key cities is far surpassing that of a year ago, R. I. Petrie, general sales manager, announced when he returned to the factory last week for a breathing spell of a few days.

In Pittsburgh, the meeting sponsored by the distributor, J. A. Williams Co., had an attendance of 297, more than double the number that attended the same meeting a year ago. Radio and Motor Service, Inc., Altoona, Pa., and Front Co., Wheeling, W. Va., each gathered a large group at its meeting.

Following the Altoona and Wheeling meetings and a visit to the factory, the "flying squadron" which Mr. Petrie heads—consisting of A. M. Taylor, merchandising director, and J. J. O'Neil, new business manager of the Refrigeration Discount Corp.—started on the second lap of its national tour. Their itinerary now includes such key cities as St. Louis, Oklahoma City, Dallas, New Orleans, Birmingham, Atlanta, Nashville, and Knoxville.

SHREVEPORT FIRM TO SELL KELVINATORS

SHREVEPORT, La. — Interstate Electric Co. has been appointed Kelvinator distributor for 28 counties in Louisiana and several counties in eastern Texas, according to Randolph A. Querbes, general manager. Southwestern Gas & Electric Co., former distributor, will continue as a dealership under the new plan.

A FACT THAT 10 YEARS IN THE REFRIGERATION INDUSTRY HAS TAUGHT US

. . . *Size* vs. STABILITY

Recent events have shown how little relation there is between size and stability. In business, as in banking, the smaller, conservatively operated concerns have demonstrated their ability and fitness to survive wide-spread economic disaster. The conservatism which has marked the operation of Universal Cooler Corporation is a matter of open record.

UNIVERSAL COOLER CORPORATION

DETROIT, MICHIGAN — BRANTFORD, ONTARIO

MANUFACTURERS OF A COMPLETE LINE OF HOUSEHOLD AND COMMERCIAL REFRIGERATION EQUIPMENT

AIR CONDITIONING

WESTINGHOUSE USES F-12 IN AIR COOLERS

(Concluded from Page 1, Column 4)

equipment for railway service, having furnished a number of such units last year to the Illinois Central Railroad. As yet the company does not contemplate entering the field of air conditioning for theaters, public auditoriums, office buildings, etc.

Although engineering details of the new room conditioners have not been revealed, it is known that they employ two low-speed, turbine-blade fans to draw in air through intakes in the ends of the cabinet, forcing air up through cooling or heating coils and up through top grilles into the room. (See picture on page 1.)

Two exterior finishes are being offereed on the floor-type units. First is decorative micarta, a Westinghouse product; second is steel finished in walnut or other desired finishes. Both heating and cooling coils are of finned type, and are mounted in the top of the cabinet.

Freon (F-12) is the refrigerant used, while steam and hot water will be employed for heating. Control switches are mounted in a small panel on the side of the cabinet; one switch controls the refrigerating machine, the other regulates fan operation.

When fresh air should be introduced, provision can be made to bring in outdoor air through an intake in the rear of the cabinet, a damper controlling the proportion of fresh air to recirculated air.

The air-conditioner assembly is completely installed before the exterior casing is put in place, thus concealing all connections and reducing danger of marring the finish during installation.

Air is filtered by a copper wool screen. Total volume of air circulated by the one-ton floor type cabinets is 450 cu. ft. per minute.

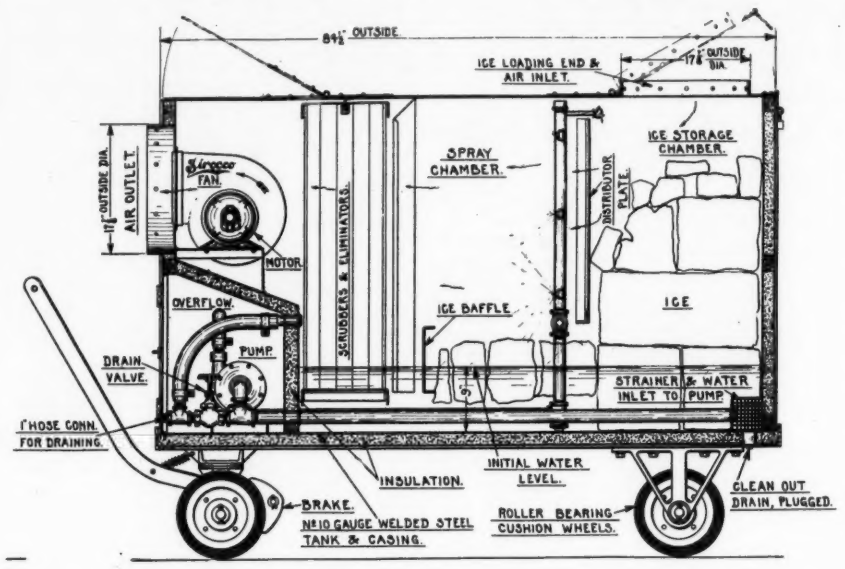
The two-, four-, and six-ton overhead air-conditioning units are built in three sections. First section contains the circulating fan and air filter; second section houses the heating coils and humidifier; and third section consists of cooling and dehumidifying coils.

Thus combinations of the sections may be installed. First and second sections would provide cleaning, circulating, heating, and humidifying for winter, whereas the first and third section would produce summer functions of cleaning, circulating, cooling, and dehumidifying. All three sections provide all six functions of complete year 'round air conditioning.

Humidity, condensed on the cooling coils, is collected in a pan and drained off. A coil temperature of 40° F. is maintained by the refrigerant.

Moisture for increasing humidity in the winter is added by two water sprays which atomize water in the path of incoming air where it is absorbed as vapor. Protection against waste of water, should the power fail, is provided by electric solenoid valves in the water feed line. If the fan stops, the valve shuts off the flow of water.

Railroad Car Pre-Cooler



Details of American Blower's portable cooler for pre-cooling Pullman cars standing in a railroad station.

* * *

Sirocco Unit Pre-Cools Railroad Cars

(Concluded from Page 1, Column 5)

Mounted on wheels, the new cooler is 64 in. high, 39½ in. wide and 84½ in. in length. When loaded with ice and water, ready for operation, it weighs approximately 3,000 lbs. The ice chamber has a capacity of 600 lbs. of ice. The Sirocco fan which circulates the air has a capacity of from 1600 to 1800 cu. ft. of air a minute.

Under average conditions the time necessary for pre-cooling a car runs between two and three hours.

MOTORS METAL TO SELL BRIGHT COMFORT COOLER

(Concluded from Page 1, Column 2)

A part of its top is closed to support a motor-driven duplex centrifugal blower which draws air from the floor and passes it over cooled metal fins through ports into the blower, and then through a metal grille at the upper left corner of the unit's front side.

It is through the open part of the inner container that ice is placed in the cooler. Another metal unit entirely surrounds the inner box. The outer cabinet is partially open at the bottom and is enough larger than the inner container to permit passage of entering air between the two.

Feature of the Komforte Koolaire is its discharge of cooled air at an upward angle from the outlet grille in the unit.

This, Mr. Bright points out, prevents warm air near the ceiling from being momentarily pushed down as it would by a blast of air rising straight from the unit, and does not permit the discharge of air to strike persons seated directly in front of the cooler, as might be the case if the air stream were forced out horizontally.

Unit is mounted on four 5-in. rubber-covered casters, and is equipped with a drain cock and syphon for emptying water. It maintains an air stream of approximately 1,000 ft. per minute.

Bright Cools Beer in Komforte Koolaire

DETROIT—Passage of the federal bill legalizing 3.2 per cent beer gave George Bright and his chief engineer, Robert Doremus, an idea.

They decided to be "in tune with our times," so now they are designing a beer-cooling compartment for their portable air conditioner, the Komforte Koolaire.

When the new feature has been incorporated into the unit, the cooler's top will be on hinges. Beneath the top, at one side of the inner container, will be a shelf on which a small block of ice may be placed.

Water melting from the ice will assist in maintaining the proper water level, and between the ice and the top will be space sufficient for storing about a dozen bottles of beer. The new feature will be used in all of the units not now in production.

Advantages of the concealed beer bin, as pointed out by Mr. Bright, are: 1. It is a good sales feature. 2. It saves trips to the refrigerator in the kitchen. 3. It makes possible a reserve for guests. 4. A snap of the unit's cover, and the beer cache is entirely concealed from teetotalers who drop in unexpectedly.

WORLD'S FAIR EXHIBITS TO BE COOLED BY ILG UNITS

CHICAGO—Several exhibits at the Century of Progress here next summer will be air cooled by equipment of the Ilg Electric Ventilating Co.

One will be the "Brick House," a model residence built entirely of brick by the Brick Association. The entire house is to be cooled and ventilated with Ilg apparatus, including a cabinet type of cooler in the dining room (connected to a one-ton compressor), a similar outfit for one of the upstairs rooms, an Ilg-Spot-Kooler, an Ilgattic system, and Ilg fans in the kitchen and bathroom.

Another installation of Ilg-Kold cooling systems will be in a 26-seat moving picture theater to be operated by a Chicago finance corporation.

The Kraft cheese division of the National Dairy Co. has designed an exhibit for the exposition to present cheese novelties. This exhibit will also be cooled with Ilg-Kold equipment.

ICE WATER SYSTEM USED TO COOL HOTEL

DETROIT—Circulating ice water of the central refrigeration system of the Fort Shelby hotel is being used to provide effective summer cooling for the main dining room of the hotel, in an air-cooling system installed by the American Blower Corp.

Ice water is piped from the cooling tank of the hotel system to three Sirocco air-conditioning cabinets in the dining room, each of which supplies 400 cu. ft. of cooled air per minute.

E. J. Bradwell, hotel manager, states that a 41 per cent increase in sales followed installation of the three units in the dining room late last summer. Not only were lunch and dinner crowds larger, but checks were bigger, Mr. Bradwell reports. The latter increase is credited to the fact that the cool and comfortable air whets the appetites of customers, and many who drop in for a cup of consomme remain to eat a full meal.

3 Units Cool 125 Diners

Although this room seats 125 diners, the three air-conditioning units do the job satisfactorily, Mr. Bradwell states. They not only cool the restaurant in summer but are year-round conditioners and serve as outlets for the hot water heating system during fall, winter, and early spring.

In the summer, ice water reaches the comfort coolers at temperatures between 40° and 45° F. It is circulated through copper finned coils, above which are located two noiseless centrifugal fans.

All movement of air is through the top of the units, the fans drawing the air from the room down into the units, pulling it over the coils and forcing it back into the room. The three units are concealed behind iron grille-work beneath windows.

High Humidity Problem

One of the chief concerns of the management at the time it was decided to air condition the dining room was the high humidity. They did not desire unusually low temperature, but they were most interested in eliminating the "sticky" atmosphere which prevailed in the place during summer months.

American Blower Corp. engineers found that by using the ice water supply they could obtain a sufficient temperature reduction, and at the same time considerably decrease the percentage of humidity in the air. The dehumidifying results from natural condensation that takes place during the cooling of the air.

Slight Temperature Difference

The difference between the inside and outside temperatures is only a few degrees, but there is a comparatively large decrease in the percentage of humidity, and, as a result, comfortable conditions are produced.

Another feature of this system is that no water is wasted. The cooled water is circulated from the reserve tank through a closed system, being just as suitable for drinking purposes as it was prior to its use in the conditioners.

Cost 10 Cents Per Hour

During warm weather the three units are operated 24 hours a day at an estimated cost of 10 cents per hour.

Water removed from the air in the dehumidifying process is collected in a special drip pan connected with a waste drain, preventing any traces of moisture on the outlet grilles, windows, or housing.

FRIGIDAIRE AIR COOLING PROGRAM STARTS APR. 15

(Concluded from Page 1, Column 5)

carries selling points for various types of installations.

Demonstration albums with actual installations pictured, a file of testimonials from users and several direct mail advertising pieces complete the sales literature.

National advertising started some weeks ago with full pages in leading class publications and business magazines reaching the restaurant, hotel, and other trades interested in comfort for customers.

Newspaper advertising for spot coverage of localized markets is being supplied districts, distributors, and dealers.

STATE HOSPITAL BUYS WESTINGHOUSE UNITS

CONCORD, N. H.—Twenty-two Westinghouse refrigerators and five water coolers were recently sold to the Concord State hospital here by Frank Donahue, proprietor of the Reliable Wiring Co., local Westinghouse dealer.

The five water coolers—four domestic models and one larger model—are operated by a Westinghouse AS-50 compressor.

PACKAGES OF POWER FOR AIR CONDITIONING

1. HIGH-TORQUE CAPACITOR
2(A) AND 2(B) ADJUSTABLE VARYING-SPEED CAPACITOR. (A) STANDARD. (B) SPECIAL
3(A) AND 3(B) CONSTANT-SPEED, RESISTANCE SPLIT-PHASE. (A) STANDARD. (B) SPECIAL
4. CONSTANT-SPEED POLYPHASE
5. PERMANENT SPLIT-CAPACITOR

WHETHER your requirements call for standard or highly special fractional-horsepower motors, in sizes from 1/750 to 3/4 hp., the cumulative experience gained in studying and meeting the needs of users of fractional-horsepower motors makes it possible for General Electric to offer you the *right* motor for the job.

It will pay you to get in touch with a G-E motor specialist. He can easily be reached at a nearby G-E office. Or, if you desire, address your inquiry to General Electric Company, Schenectady, N. Y. Investigate also, G-E transformers, cable, and other electrical necessities.

G.E. builds a line of quiet, dependable fractional-horsepower motors that accurately meets the needs of these and other air-conditioning applications:

Air Filters
Air Washers
Atomizers
Automobile Heaters
Barn Ventilators
Bathroom Heaters
Blowers (All types)
Booster Fans
Bus Heaters
Cabinet-type Units for heating, cooling, humidifying, dehumidifying, washing, and filtering air
Domestic Air Conditioners
Exhaust Fans
Fans
Forced Draft Units
Furnace Fans
Garage Heaters
Humidifiers
Incubator Fans
Industrial Air Conditioners
Kitchen Ventilators
Paint Spray Booth Fans
Propeller Fans (All types)
Railway Car Air Conditioners
Railway Car Precooling Units
Refrigerator Fans
Room Coolers
Rotary Roof Ventilators
Schoolroom Heaters
Special Devices
Unit Coolers
Unit Heaters
Unit Ventilators
Window Ventilators

210-205 HH

GENERAL ELECTRIC

AIR CONDITIONING

Westinghouse Engineers Investigate Reversed Refrigeration Cycle

EAST PITTSBURGH, Pa.—To investigate the practical possibilities of the reversed refrigeration cycle, Westinghouse engineers have been experimenting with an installation of such equipment in Reading, Pa.

During the past winter, an occupied house was heated in this manner. Although the equipment used was more or less experimental, the principles involved were demonstrated.

During the coming winter an improved installation will be in operation to solve certain practical problems still remaining, and also to obtain additional data regarding economic limitations of its use in severe climates.

This type of equipment can be arranged to cool in summer as well as to heat in winter, and, in fact, one of these installations was used for this purpose during some of the warm weather of last summer.

This development has not yet reached the commercial stage, so that no apparatus is now available. However, it is anticipated the tests of the coming winter will help to settle the remaining problems involved.

W. C. Goodwin, in charge of engineering on Westinghouse air-conditioning apparatus, explains that air-conditioning equipment absorbs heat from inside the house in summer, pumps it to the outside and discards it—just as an electric refrigerator picks up heat from inside the food compartment releases it into the room.

In winter, the cycle is reversed, he states. "Heat is picked up from the outdoors and brought inside to warm the house, coils inside the house which formerly absorbed heat become radiators, while the outside coils instead of throwing off heat absorb warmth from the outside air.

"It seems a paradox to get heat from the cold outdoors to warm a house, but the explanation lies in the fact that the atmosphere is only relatively cold; even 0° F. is some 460° above absolute zero.

"In reversed refrigeration, no heat is generated, but is merely pumped from the tremendous outdoor reservoir to inside the house."

Since heat is not generated but merely transferred from the outside to inside the house an efficiency of 300-500 per cent is obtained—i.e. the electric current consumed in pumping produces three to five times as much house heat, as if the same electricity were directly converted into heat.

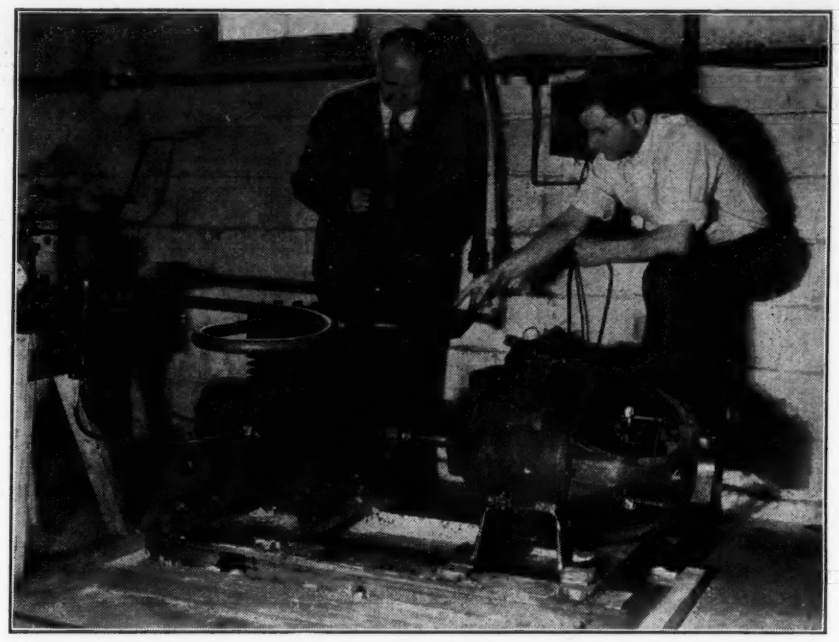
Benefitting by the experience of last year's test the Westinghouse company is equipping a second house near the research laboratory with an improved system.

"There are many problems yet to be solved before reversed refrigeration equipment becomes commercial," Mr. Goodwin admits. "From an operating point of view, it is desirable to run the compressor at variable speeds, and it is quite likely that a variable speed motor drive will be excessive in first cost.

"When a constant-speed compressor is used, with frequent starts and stops, the problem of starting current may become quite objectionable particularly in residential districts where three-phase power is not available.

"The noise problem is one that requires much careful consideration, particularly the noise from the compressor itself. This, however, will be largely solved by locating the compressor in an assembly with the evaporator unit outside of the building, leaving only the circulating fan as a noise producing device associated with the air-duct system," he predicts.

Heat Pump on Trial



Six-ton refrigeration system installed by Westinghouse as an experimental heat pump in a brick house in Reading, Pa.

ILG SYSTEMS INSTALLED IN CANDY PLANT

PHILADELPHIA—Three new Ilg-Kold air conditioning systems are being installed in the manufacturing plant of the Whitman Candy Co. here, following installation about two years ago of two similar jobs.

CLEVELAND RESTAURANT TO BE COOLED BY ILG

CLEVELAND—First of the Clark chain of restaurants in this city is to be air conditioned this summer with equipment installed by Ilg Electric Ventilating Co.

Morse New President Of American Blower

DETROIT—Clark T. Morse, former vice president in charge of sales, has been elected president of American Blower Corp. of this city, manufacturer of air-conditioning and air-handling equipment for homes, industries, and public buildings. James Inglis, president of the corporation for many years, has been made chairman of the board.

Frederick R. Still was re-elected to the vice presidency in charge of export with headquarters at New York. Rawson Valle, formerly secretary, has been made secretary and treasurer.

UTILITY TO PROMOTE CONDITIONER SALES

DETROIT—In accordance with plans announced two months ago, the Detroit Edison Co., utility here, is preparing to send to all prospects for air-conditioning equipment in Detroit a letter and folder designed to increase their interest in comfort-cooling equipment.

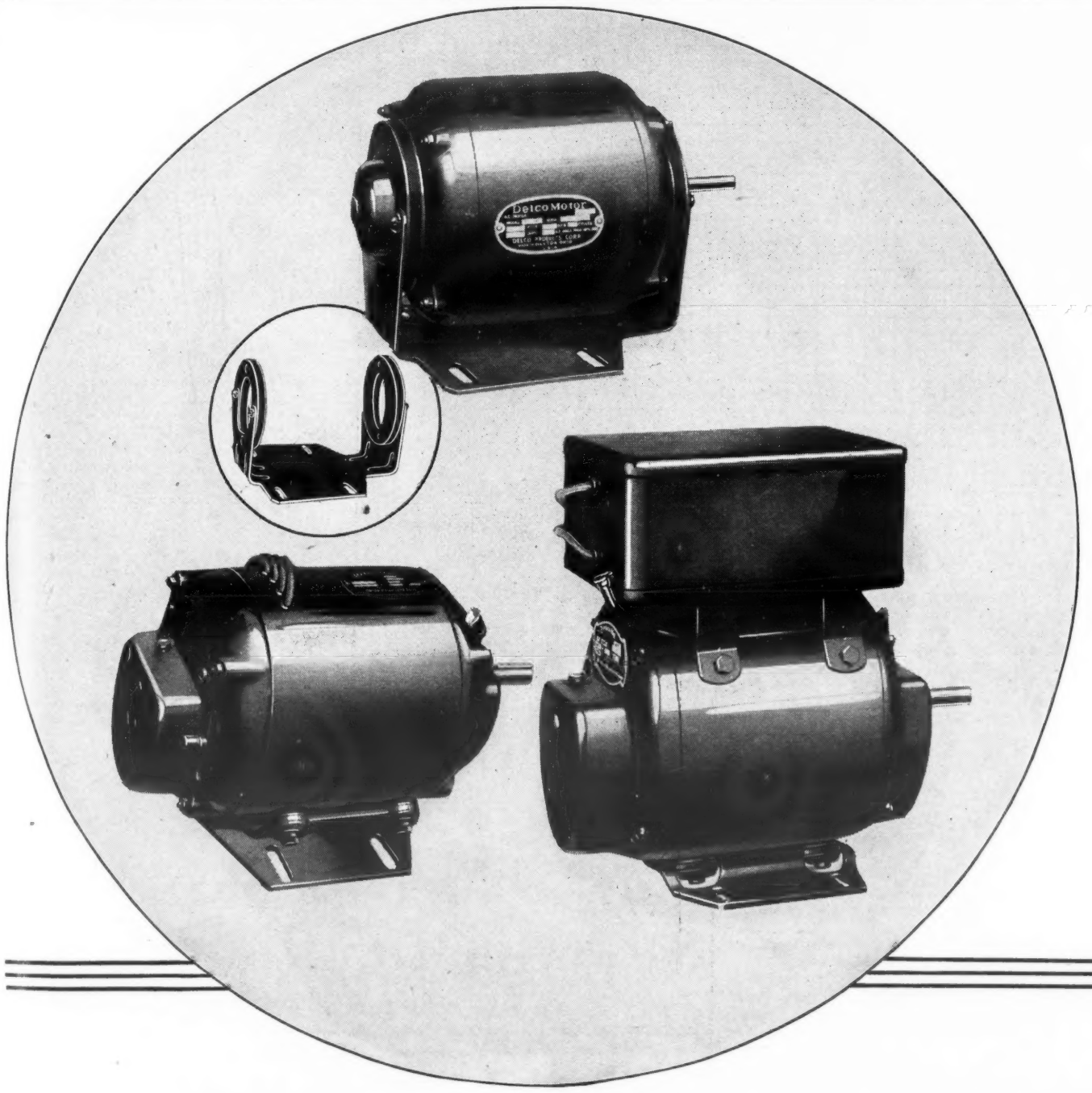
Under a caption which reads, "Cool your store or home this summer for a few cents a day," the mailing piece points to Detroit business establishments which have avoided summer income slumps by virtue of their air-conditioning systems. It explains that installation of such equipment is not a complicated procedure, and says that suitable apparatus may be purchased for $400 to $500 (for relatively small quarters).

The piece also outlines the advantages of comfort cooling in the home. The letter accompanying the mailing piece uses the economy of air conditioning as an attention-getter, and suggests that it might be to the recipient's advantage to talk the matter over with an air-conditioning salesman who will call soon.

This text is printed on letterheads of any Detroit air-conditioning sales company, and sent to the latter's prospects without any cost (except postage) to that organization, as the Detroit Edison Co. bears all printing expenses as a part of its air-conditioning sales promotion activity.

Independent Air Filters Used in Church

PITTSBURGH—Air filters made entirely of aluminum and manufactured by the Independent Air Filter Co. of Chicago have been installed in each of the heating and ventilating ducts of the new East Liberty Presbyterian church here.



A REFRIGERATOR IS NO BETTER THAN ITS MOTOR

Equip your refrigerators with Delcos, the motors that were developed expressly for electric refrigeration service. They're the strongest "links" you could provide in the chain of refrigeration performance.

Delco motors have met the test of time. They are giving satisfaction in more than two million household refrigerators in use today.

They are quiet, when starting as well as when running. They do not draw starting current in excess of domestic limitations. They do not interfere with radio reception.

They require little attention—you can get Delco motors with Sealed Lubrication that will run for years without even requiring re-oiling. And you can get Delco motors with a new rubber-cushion mounting that eliminates vibration and muffles electrical hum.

Delco refrigerator motors always fit their jobs, electrically as well as mechanically, for every Delco split-phase, repulsion-induction, or condenser-transformer type motor is individually engineered to fit the exact needs of the compressor unit it drives.

DELCO PRODUCTS CORPORATION · DAYTON, OHIO

AIR CONDITIONING

New Fan with Slotted Blades Designed To Give Uniform Air Delivery

By John T. Schaefer

CHICAGO—First developed for use in cabinet type air-conditioning systems, and now being applied to forced-draft cooling of condensers on household electric refrigerators, Duo-Gyrovane fans have just been announced by the General Regulator Corp. of this city. The new fans are of the five-blade propeller type, but are distinguished from conventional radial-blade fans by radial slots in each blade and the peculiar shape of the blades, according to Guy S. Faber, General Regulator's thermodynamic engineer and designer of the new product.

As shown in the picture below, each vane in the fan has a slot dividing it into two separate parts, each of which has different pitch and curve characteristics.

"When in motion, the flow of fluid from the first to the second surface sets up a vacuum pull through the slot," Mr. Faber explains. "This mechanical jet action gives the fan its inherent characteristics."

The position of the slot in the blades causes the air flowing through to be cut tangentially, reducing friction and blade whip, he claims. In addition, the blade is compensated for a uniform flow from tip to hub by widening the blade, and increasing the pitch toward the center. Thus air currents passing through the blade constantly flow toward the center, he explains.

Chief feature of the Duo-Gyrovane fan is in refrigeration work its ability to deliver air over its entire area, from tips to hub, Mr. Faber points out, so that it is practically 100 per cent "alive." This characteristic of the fan permits constant cooling over a larger area of a refrigerant condenser than with a radial blade fan which is 25 per cent "alive" or a cupped fan which is 64 per cent "alive," he shows.

Another advantage claimed is reduction in noise due to equalization of air flow from tip to hub, and the fact that the air fluid is traversed tangentially as it passes through the slotted blade. Also, reduction of vortexing at the blade tips eliminates blade whip and vibration which produce much of the noise of ordinary propeller fans, he declares.

Acoustical tests conducted in a sound-proof room by Emery Nielson, acoustical engineer of the Burgess Laboratory, Madison, Wis., showed that a 7-in. Duo-Gyrovane fan produced an average noise level of 44.4 decibels, as compared with an average noise reading of 54.85 decibels for a radial blade fan.

In making the noise tests, a Jenkins & Adair microphone was used to pick up sound, while a Burgess Parr acoustimeter was used to measure the sound. The microphone was placed at a height about equal to that of the motor shaft, parallel to the shaft and about 30 in. away. It was placed off to one side so that it would not be in the air stream of the fan, Mr. Faber explains. The noise level of the motor alone, incidentally, was found to be 36.5 decibels.

Exploration of the air currents set up by a standard radial type propeller fan by means of a miniature anemometer and with a smoke bottle, disclosed considerable vortexing at the tips of the blades, Mr. Faber asserts, and the fact that much of the air delivered by the fan actually comes from front instead of the back of the fan (see air flow diagrams).

When operating the radial propeller fan against a static head, there is actually a flow of air back through the center of the fan, he reports.

Similar explorations of the air currents produced by the Duo-Gyrovane fans indicates that it secures practically all of its air delivery from the back of the blade, Mr. Faber maintains. The air approaches the fan in a conelike flow, and is delivered from the fan in a solid cylinder of the same diameter as the fan (see air flow diagrams).

Another interesting feature of the Duo-Gyrovane fan is its non-overloading characteristic, similar to that of a centrifugal fan, Mr. Faber avers.

Because of the fact that centrifugal fans use inherently less power as the static head is increased, they are widely used in mechanical ventilation where the air is discharged through orifices in ducts that are subject to manual control.

In such applications, the static pressure against which a fan is operating may be materially increased, a condition which is handled satisfactorily with centrifugal fans, but which would seriously overload the motor driving a conventional radial type of fan.

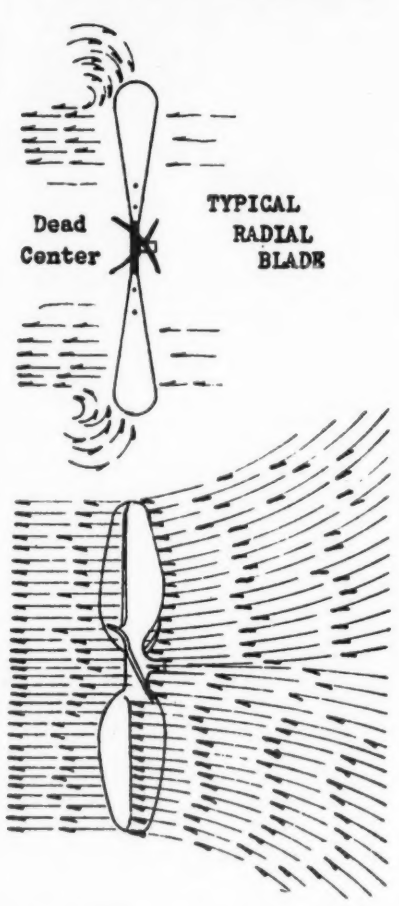
The Duo-Gyrovane fan, like the centrifugal fan, requires less power as the static pressure goes up, hence it may be freely used in duct work where manipulation of shutters or dampers would increase the static head, Mr. Faber states.

Performance tests conducted by Prof. Linn E. Davies and Prof. G. F. Febhardt at the Armour Institute of Technology, Chicago, showed that a four-blade, 10 in. Duo-Gyrovane fan attained its maximum efficiency of 41 per cent with a static pressure of .11 in. of water. At this point it was delivering about 365 cu. ft. of air per minute, measured with a Pitot tube. Watts input to the fan dropped as static pressure was increased.

Mr. Faber stresses the distinction between air delivery ratings measured on the Pitot tube basis, and those made in free air with an anemometer.

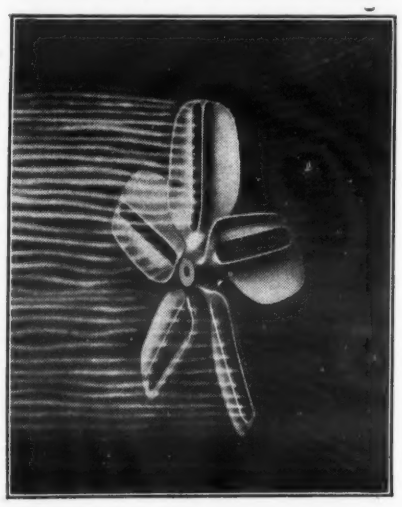
Anemometer readings are not recognized by the fan association or the A.S.H.V.E., Mr. Faber states, only Pitot tube ratings. For a basis of comparison with fan rated with anemometers, Mr. Faber offers the figure of 1,104 cu. ft. per minute maximum output, as compared with 525 cu. ft., the maximum air delivery measured with a Pitot tube.

Air Flow Diagrams



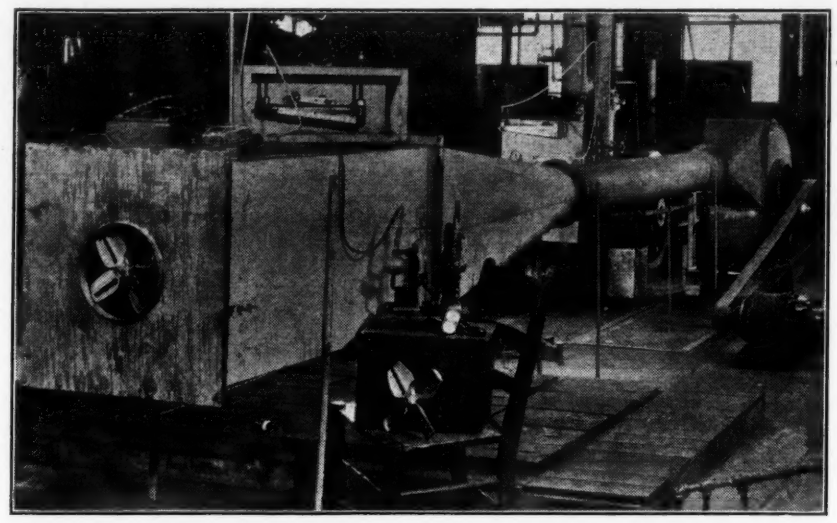
Mr. Faber's conception of air flow through a conventional propeller type fan (above), through the Duo-Gyrovane (below).

Straight Line Discharge



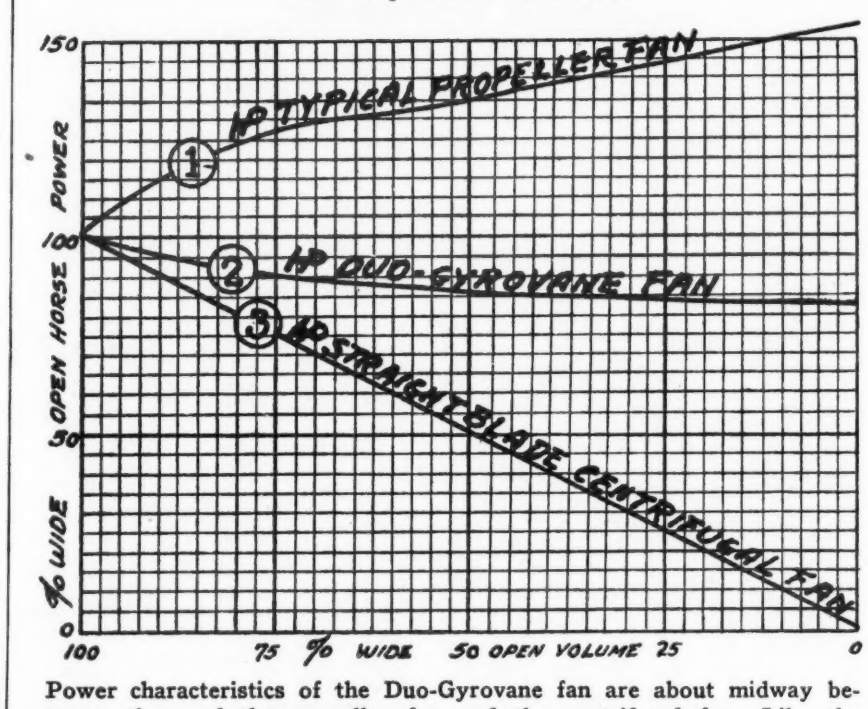
Uniform, cone-shaped air delivery of the Duo-Gyrovane fan.

Armour Institute Tests



Equipment used to test a 10-in., four-blade Duo-Gyrovane fan at Armour Institute of Technology. Gauges for Pitot tube measurements appear on the panel board behind the metal duct. In the foreground atop the test apparatus, and on the chair, are gauges for measuring static pressure. All tests were made according to the A.S.H.V.E. code.

Horsepower Curves



Power characteristics of the Duo-Gyrovane fan are about midway between those of the propeller fan and the centrifugal fan. Like the centrifugal fan, the Duo-Gyrovane is non-overloading, since power consumption decreases with increases in static pressure.

COOLING UNIT ADDED TO DAIL CONDITIONER

LANSING, Mich.—Dail Steel Products Co., furnace manufacturer here, has redesigned its heating equipment to permit addition of cooling and dehumidification apparatus to the eight models of its line, and is making the cooling attachment which is adapted for use with any type of refrigeration.

Dail furnaces are equipped for cooling and dehumidification by installation of a fin type coil within the one- or two-fan blower unit which is a regular part of the company's heating apparatus.

Through these coils, water or refrigerant is circulated and air is blown across the cooling coils and up into the rooms of the house or small place of business.

When water is available at a temperature of 60° F. or lower, circulation of five to eight gals. per minute through the cooling coils will cool and dehumidify the air in two or three rooms to approximately 75° F., the manufacturer claims. This water may be by-passed back into the water system and used for lawn sprinkling.

When no water is available at this temperature, it must be pre-cooled with ice refrigeration, or electric refrigeration may be used to cool the coils by direct expansion or cold water circulation.

G. E. CONDITIONERS TO BE SOLD ON NEW CREDIT PLAN

SCHENECTADY, N. Y.—A new credit policy whereby time-payment instalments on oil furnaces will be suspended during the summer months as an experiment to maintain sales activity at an even level the year 'round has been announced by the air-conditioning department of General Electric Co.

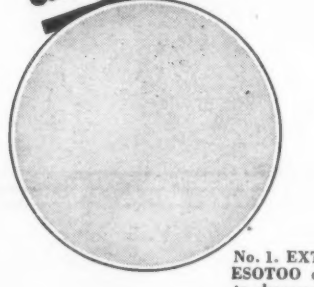
On purchases made after March 20 only a small down payment will be required and the monthly payments will start in the fall.

"People who want to improve their homes should be helped to do so right away while labor and material costs are low," stated J. J. Donovan, manager of the air-conditioning department, in explaining the plan.

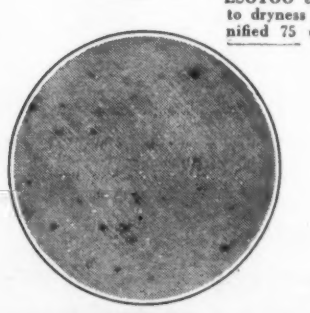
STURTEVANT SYSTEM USED IN MAKING LENS

BOSTON—Air-conditioning equipment manufactured by the B. F. Sturtevant Co., Inc., of this city is a part of the apparatus being used by experts who are grinding the large lens of the new telescope in the Mt. Wilson Observatory, according to Carl C. Gray, in charge of merchandising for the Sturtevant company. Those making the lens declare that use of air conditioning in the grinding process will reduce by several years the length of time required to complete the lens.

Pure, clean Sulphur Dioxide saves trouble for the manufacturer and service man--



No. 1. EXTRA DRY ESOTOO evaporated to dryness and magnified 75 diameters.



No. 2. Well known sulphur dioxide, refrigeration grade, evaporated to dryness and magnified 75 diameters.

Reprints of "Study of Pure Liquid Sulphur Dioxide by Microphotographs" from Industrial and Engineering Chemistry are now available. We will gladly mail you a copy on request. Write for it today.

Our refrigeration grade SO_2, known everywhere as EXTRA DRY ESOTOO is PURE and CLEAN, as these microphotographs show. Through every step in its production, every care humanly and scientifically possible is exercised to keep it so.

For proven purity and performance, specify EXTRA DRY ESOTOO. Prompt Service from 28 convenient distributing points. Cable Address: "EUSTIS BOSTON."

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Virginia Smelting Co.
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Now Speed Larkin Coil Service to the Nation!

Now Over 38,000 Larkin Coils in Daily Use

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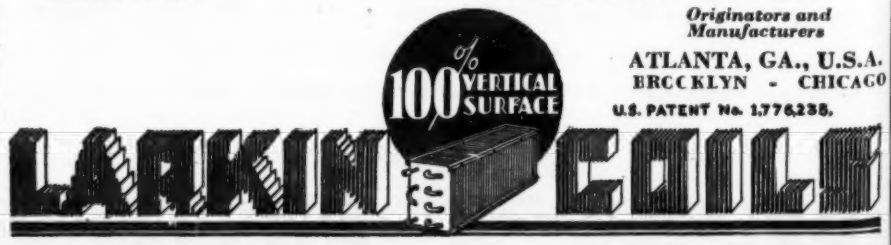
LARKIN Refrigerating Corporation

Originators and Manufacturers

ATLANTA, GA., U.S.A.
BROOKLYN - CHICAGO

U.S. PATENT No. 1,776,238.



AIR CONDITIONING

Food Serving and Retail Stores Best Market

DETROIT—The best markets for air-conditioning equipment have been among restaurants, tea rooms, display rooms of department stores, candy shops, funeral parlors, and drug stores, according to officials of the Universal Cooler Corp., refrigerating machine manufacturer of this city which has developed condensing units for the special requirements of air conditioning.

A strong factor influencing commercial establishments to invest in air conditioning has been observation of competing businesses which experienced an increase in their summer revenue after installation of air-conditioning equipment, they report.

Three different methods have been widely used in applying electric refrigeration to apparatus for cooling and dehumidifying, according to David Newton of Universal's air-conditioning engineering department. These are direct expansion, circulation of cold water through air-cooling coils, and passage of cold water through sprays in an air stream.

In direct expansion, the refrigerant is passed through an expansion valve direct into an evaporator coil in the stream of air being cooled, moisture being condensed on the cold coil surface and passing down to a drain pan, and thence to the sewer. Picture below shows a typical direct expansion air-conditioning unit, manufactured by the Conditioned Air Corp. of Detroit.

The second method of cooling is by means of a water cooler operating in conjunction with the refrigerating machine. Refrigerant is expanded into a coil within the cooler, and the cold water is pumped to a cooling coil in the air stream, the coil producing practically the same effect as a direct expansion coil mentioned above.

In the third method of cooling, Mr. Newton explains, water is refrigerated in a water cooler and then sprayed into the air stream in the air conditioner. Water collecting in the spray chamber is collected and pumped back to the water cooler.

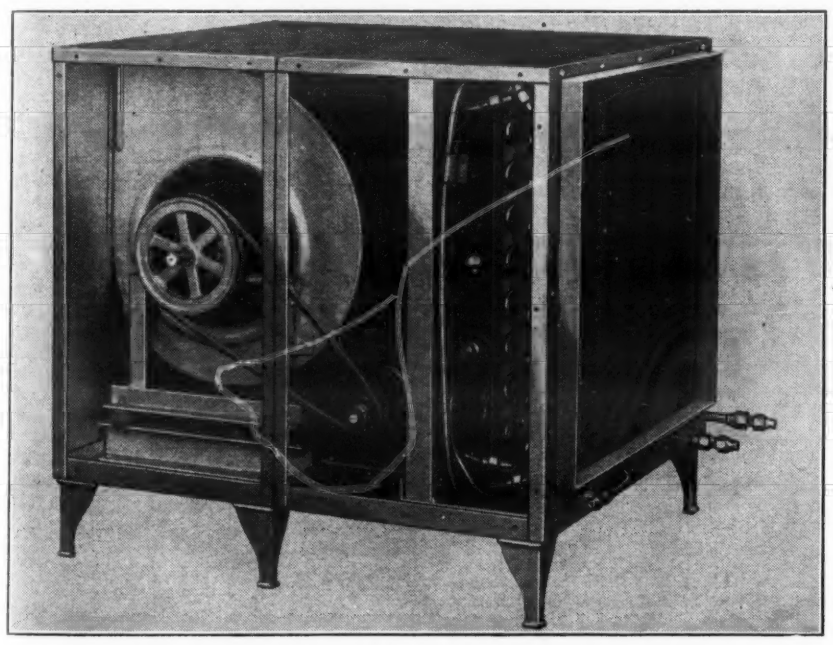
Picture above shows a 5-hp. Universal Cooler condensing unit with a water-cooling tank built as an integral part, designed for air-conditioning installations using the cold water methods of cooling.

Control of direct expansion systems is maintained by a thermostat installed in the space being conditioned, Mr. Newton points out. The thermostat operates the pressurestat on the refrigerating machine, starting and stopping it as needed.

Systems in which cold water is circulated either through coils or sprays in the air stream employ a thermostat to start and stop the water circulating pump. As the pump is started and stopped, the thermostatic expansion valve actuates the pressurestat on the refrigerating machine to govern its operation.

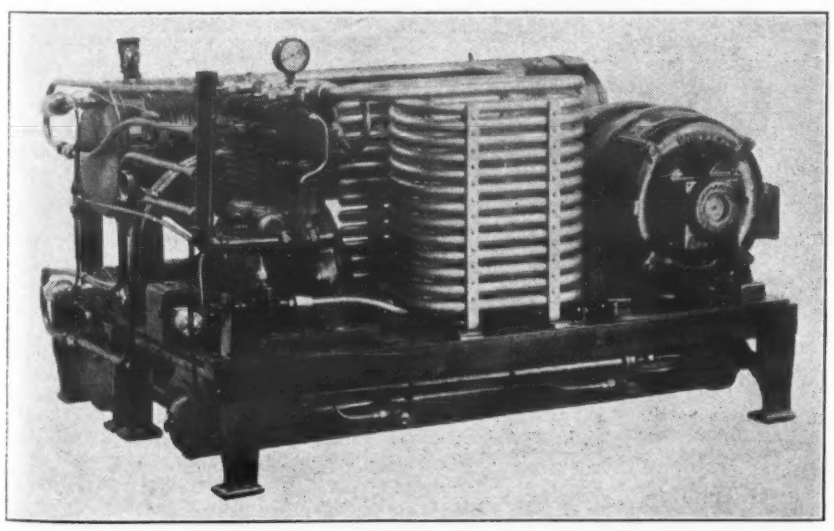
* * *

Air Conditioning Cabinet



Re-designed cabinet of the Conditioned Air Corp. of Detroit.

Special Machine for Air Conditioning



Universal Cooler engineers have developed this special 5-hp. condensing unit for air conditioning. Two built-in water-cooling tanks are provided as part of the equipment (visible in rear).

* * *

AIR CONDITIONING TO BE BIG UTILITY LOAD

By R. E. Hellmund
Chief Electrical Engineer,
Westinghouse Electric & Mfg. Co.

INDIVIDUAL phases of air conditioning, such as heating, cooling, humidifying, dehumidifying, etc., are naturally seasonal in most climates, and unless all of phases involved can derive their power supply from the same system a good load factor cannot be expected.

Unfortunately, heating by the use of electric power, either by direct electric heating or by means of reversed refrigeration, is still too expensive for the average user in a good many localities.

In the southern and warmer climates, and also in certain other localities where the cost of fuel heating is relatively high, summer cooling and dehumidifying by means of mechanical refrigeration equipment, and winter heating by the reversed refrigerating cycle hold out some promise for an economical solution and a central station load with high-load factor.

The following brief outline indicates how in other localities where fuel heating has to be resorted to during at least part of the year, electric power can be utilized to add greatly to the comfort and convenience of the user and at the same time furnish a fairly uniform load.

Rather than starting out with an equipment which would give 100 per cent conditioning for the entire house throughout the year, these considerations are based on an arrangement which will operate at an expense adapted to the average pocketbook.

Let us assume that the equipment consists of a refrigeration compressor with a rating between 1½ and 2 hp. If operated at full load during a large part of the day, this will mean a power bill of $.90 to $1.80 a day at a 3-cent rate, and $.60 to $1.20 at a 2-cent rate.

The small equipment will permit the cooling of any one room in the house and could be arranged to cool the living room during the day, the dining room during meal hours, and the bedroom during the night, which would greatly increase the physical comfort in the home, for a moderate cost.

It is further to be considered that in many climates the expense indicated would apply only during a limited number of days during the month, so that the power bill might be from $15 to $20 a month for two or three of the summer months.

If the larger equipment such as the 3-hp. machine is used, possibly two rooms could be cooled at a time at correspondingly larger expense. As already indicated, if such an equipment is used for cooling only, it would have a rather poor load factor.

However, with the equipment arranged for reversed refrigeration it would be suitable for heating the entire house during certain periods in spring and in the fall, making it unnecessary to start up the coal furnace during those periods.

With such an arrangement, the coal furnace would furnish heat during the two or three extremely cold months of the year.

The outside walls of a building are colder than the inside walls. Therefore any location in the house permitting the radiation of body heat toward these cold outside walls can never give comfort due to the fact that up to 40 or 50 per cent of the heat is lost by radiation.

This difficulty can be entirely obviated by supplementing the air-heating system with arrangements for a small amount of panel heating, thus preventing radiation from the body to the outside walls.

This can be done either by heating the outside walls directly with a rather low wattage or by using portable heating screens placed near outside walls which must be occupied, such as around desks, armchairs, and the like.

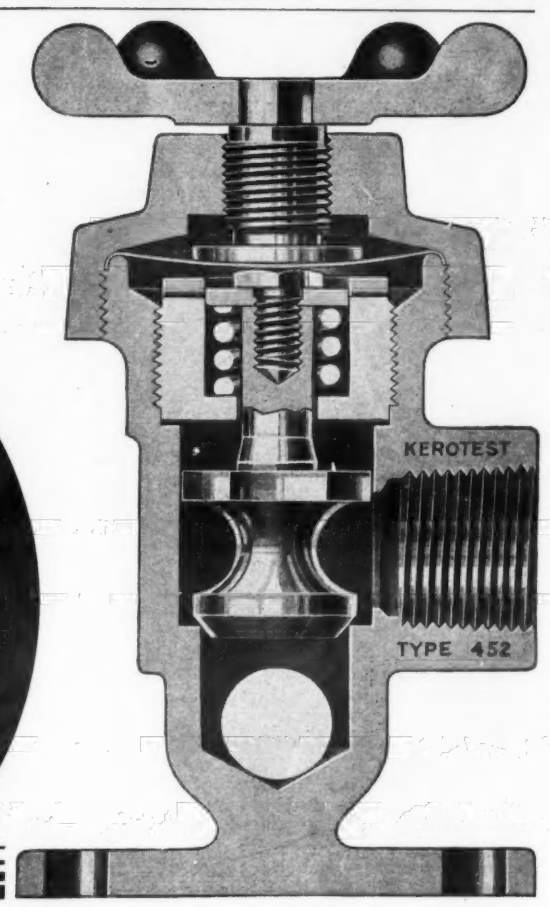
The total wattage consumed for such purposes is very moderate and will be largely compensated for by economies in fuel, at the same time will furnish a desirable central station load when the fuel furnace is in operation.

As a consequence, the power companies could well afford to advoate the installation of mechanical refrigeration and heat pumps together with the installation of panel heaters, supplemented possibly by various existing types of convection heaters found in modern homes.

MILWAUKEE DISTRIBUTOR SHOWS G. E. CONDITIONER

MILWAUKEE—The Pflugradt Co., newly appointed distributor for General Electric air-conditioning equipment and oil furnaces, held a formal opening the week beginning March 27 in its new showrooms here with more than 5,000 people attending.

The new distributor has leased three showrooms adjacent to the main showroom of the E. H. Schaefer Corp., distributor of G. E. home appliances. The entire front of the block is now occupied by showrooms displaying G. E. products, according to E. H. Schaefer, head of the E. H. Schaefer Corp. A large opening has been cut in the wall to connect the oil furnace and air-conditioner display room with the appliance showroom.



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Technical Functions and Applications Of Air Conditioning Defined

By W. A. Furst, Westinghouse Electric & Mfg. Co.*

AIR conditioning may be defined as the art or science of producing any desired atmospheric conditions within an enclosed space.

The object of air conditioning may be to increase human comfort and health within the enclosed space, or else the control of industrial processes. Air conditioning may include the consideration of any one or more of the following factors:

1. Control of the air temperature. (Dry-bulb temperature.)
2. Control of the humidity.
3. Air cleaning.
4. Air circulation.
5. Air quality.

Air-conditioning theory and practice in the first four factors mentioned are now fairly well established. On the other hand, the factor of air quality is still somewhat in an indefinite stage, and considerable work must still be done to determine the effect of ionization, ozonation, and similar factors, before an air-conditioning engineer can allow for these qualities in the same confident manner that he allows for humidity and air temperatures.

In any air-conditioning problems, the properties of the mixture of air and water vapor in the space to be conditioned are usually of first importance. At this point, therefore, we will give a few definitions of some of the factors considered by the air-conditioning engineers when discussing the properties of air and water vapor mixture.

Dry-Bulb Temperature

The temperature as determined by an ordinary dry-bulb or mercury thermometer is known as the dry-bulb temperature. By way of illustration, if you ask someone how cold it is this morning and he answers 75°, he will be giving you the dry-bulb temperature.

At a given temperature, a given amount of space can hold just so much water vapor without condensation occuring. If all the moisture is present that the air can hold, it is said to be at 100 per cent relative humidity and is at a temperature of saturation.

If the dry-bulb temperature of the air and water vapor mixture is now increased, but the amount of water vapor is unchanged, the temperature corresponding to the saturation or 100 per cent relative humidity will be unchanged.

This temperature corresponding to saturation is known as the dew point. At any dew point, a cu. ft. or pound of air will contain a correspondingly definite weight of water vapor. Therefore, any reduction in air temperature below this point will cause condensation of water vapor from the air.

The heat which causes the temperature of a substance to increase if heat is added or decrease if heat is subtracted is known as sensible heat. Sensible heat does not cause a substance to change from one state to another. In the case of an air-water vapor mixture, the sensible heat of the air varies directly with the dry-bulb temperature. The dry-bulb temperature is, therefore, an indication of the sensible heat of the air.

The heat which causes a substance to change from one state to another, without causing any change in temperature is known as latent heat. For example, the heat required to change one pound of water into one pound of steam without changing the temperature is latent heat.

Total Heat

Total heat is defined as the total quantity of heat in a substance and is equal to the sum of the sensible heat plus the latent heat.

In any mixture of air and water vapor, there is considered to be present a certain amount of total heat. This total heat is composed of the sensible heat as indicated by the dry-bulb thermometer reading, and the latent heat. The latent heat in the air is the heat of vaporization of the weight of water vapor present in the air.

The total heat of the air may be indicated by taking a wet-bulb temperature reading. The wet-bulb temperature may be determined by means of an ordinary thermometer, the bulb of which is covered with a moist clean soft cloth. Rapid air movement over the wick is essential for a true reading.

At a constant wet-bulb temperature, the total heat in the air remains constant; therefore, wet-bulb temperature is the indication of the total heat. Technically, the wet-bulb temperature is a depressed temperature reading corresponding to the dry-bulb temperature the air would assume if sufficient moisture were present to bring the air to saturation without any change in its total heat contents.

To the average air-conditioning engineer, the term "ton of refrigeration" means the rate of absorption of a quantity of heat equivalent to the heat of fusion of 2,000 pounds of ice per 24 hours. This is equivalent to 288,000 B.t.u.'s per 24-hour day, or 12,000 B.t.u.'s per hour, or 200 B.t.u.'s per minute.

Rating Refrigerating Machines

The rating of refrigerating machinery depends upon the suction and discharge temperatures used. Thus, a machine which delivers one ton of refrigeration at one set of conditions may deliver two tons at another, or only three-fourth tons at still another.

For this reason, the American Society of Refrigeration Engineers has specified certain standards of definition with respect to one ton of refrigeration as applied to compressors. However, to the average air-conditioning engineer, the term "one ton of refrigeration" is simply a shorthand method of designating a cooling capacity of 12,000 B.t.u.'s per hour.

The effects of air conditioning on man have not been given such careful study as its effects on materials. However, we do know that the feeling of bodily comfort does not depend upon temperature alone. On humid summer days, we feel far less comfortable than on low humidity days of the same temperature. Similarly, on warm days, we feel less comfortable when there is no air movement, than when there is a breeze.

Experience and laboratory tests show that the general rules for comfort are:

In summer—lower the temperature, lower the absolute humidity, and produce an air movement.

In winter—raise the temperature, raise the absolute humidity, and have only slight air movement.

Effect of Water Sprays

If we were to pass a stream of air through a sufficient spray of water (which is continually recirculated without any heat being added to the water), we would find that the water temperature would remain substantially at the wet-bulb temperature of the entering air.

At the same time, we would find that the wet-bulb temperature of the air leaving the sprays would be the same as the wet-bulb temperature of the entering air. Also, we would find that the leaving dry-bulb temperature and the dew point would be the same as the leaving wet-bulb temperature. (See Figure 1.)

In other words, the air leaving the spray chamber would have been adiabatically saturated at the entering wet-bulb temperature. By an adiabatic saturation, we mean that the total heat quantity remains constant, there being no heat added to or subtracted from the water spray or air.

The heat necessary to evaporate the spray water in order to saturate the air comes from the air itself. Its dry-bulb temperature drops to the wet-bulb temperature while passing through the spray. This is known as evaporative cooling. The leaving dew point, however, is higher than the entering dew point. This is to be expected because water vapor has been added to the air.

If the spray water were heated, still more moisture could be added to the air and the leaving wet-bulb temperature would be higher than the entering wet-bulb temperature. (See Figure 2.) On the other hand, if the spray water temperature were cooled, the leaving wet-bulb temperature would be lower than the entering wet-bulb temperature. (See Figure 3.)

If the water were sufficiently cooled, the leaving dew point would be lower than the entering dew point, and consequently the air would contain less moisture per cu. ft. when leaving than upon entering the spray. (See Figure 3.) Thus, controlling the temperature of the spray water controls the amount of moisture added to or subtracted from the air.

From the time the air leaves the spray chamber until it is delivered into the room to be air conditioned, there is no moisture added. It follows, therefore, that deciding upon a definite room temperature and humidity, fixes the dew point of the air leaving the spray chamber. The air must then pass through a heated coil so as to raise the temperature to the exact amount necessary to maintain the desired room dry-bulb temperature. (See Figure 4.)

Humidification

Humidifying is the process of adding moisture to the air. The spray humidifier controls the addition of moisture, and also can be used as a ventilating system and a means of washing the air. In addition, it affords an evaporative cooling effect in summer. Most spray humidifiers have a heating coil and thus may be used for heating in winter.

Dehumidifying is the process of removing moisture from air. A spray type dehumidifier controls the removal of the moisture; and, as in the case of a humidifying system, can be used for ventilating, cleaning, and heating. It can also, if desired, be used for the adding of moisture.

Since dehumidifying involves the removal of heat (both sensible and latent), and since in a spray type equipment the water spray acts as the heat exchange medium, such dehumidifiers may require a larger volume of spray water than is necessary for a humidifier of the same air capacity.

Adding Outside Air

With practically all installations of spray type conditioning it is advisable to introduce some outside air through the equipment. This serves two purposes. It provides ventilation and places the space to be conditioned under a slight pressure which reduces infiltration.

Where evaporative cooling is desired, outside air is necessary, for without its use the inside dry-bulb temperature would become unbearable where fairly high relative humidities are carried in hot weather.

In dehumidifying installations, the use of outside air replaces the need for refrigeration whenever the wet-bulb temperature of the outside air is below the dew point temperature at which the dehumidifier will be operated.

By surface cooling, we mean that the air to be cooled comes in direct contact with cold metal surfaces. The usual arrangement is to have the cooling surface in coil form (made with either bare or finned pipe) with air passing over the coil, and the cooling medium (which may be either cold water, brine, or direct-expansion refrigerant) circulated through the coil.

Surface heating is identical in principle with surface cooling. The only difference is that a heating medium instead of a cooling medium is circulated through the coil or radiator.

Surface type cooling equipment rightly belongs to the air-conditioning family, and is properly applied where a reduction in dry-bulb temperature is the main consideration.

Now that we have discussed, in a general way, some of the fundamentals of air conditioning as affected by properties of air and water vapor mixtures, we can proceed to a consideration of the various types of air-conditioning applications. These may be divided into two main classes as follows:

A. Air conditioning for industrial process work.
   Chief Requirements: Usually definite and fairly precise regulation of humidity and dry-bulb temperatures; with air cleaning.
   Examples: Rayon plants, printing plants, textile mills, drying applications, etc.
B. Air conditioning for human comfort.
   Chief Requirements: Maintenance of comfortable conditions by control of dry-bulb air temperatures and relative humidity; air cleaning and air circulation.
   Examples: Air conditioning of offices, homes, theaters, restaurants, etc.

Industrial Air Conditioning

Air conditioning for industrial process work usually involves the use of central fan systems with spray type dehumidifiers, air-duct distribution systems, together with close control of humidity and air temperatures—depending upon the requirements of the industrial process.

Air conditioning for human comfort may be further subdivided as follows:

a. Air conditioning for luxury as in the home.
b. Air conditioning for profit.
   1. Large theaters, large department stores, etc.
   2. Railway car air conditioning.
   3. Small commercial installations such as small restaurants, barber shops, candy stores, etc.

Home Heating Systems

While the ordinary coal fire, gas fire, or oil burner heating system in the home may be considered as a branch of air conditioning, in that they control the temperatures inside of the home at least during winter time, such systems provide only heat, neglecting the other factors of air conditioning. The average home heating system is, of course, considered a necessity rather than a luxury, at least in cold climates.

At the present time, there is considerable agitation and demand for the addition of humidifying, air-cleaning, and air-circulation equipment to the home heating system. Practically all the more recent and better designs of gas- and oil-fired house heating systems which are being put on the market at the present time include these features as optional or as standard, where a warm air duct system is used for heat distribution throughout the house.

Water pans are becoming almost standard equipment for the more modern designs of coal-fired warm air heating furnaces.

In the case of residences already having hot water or steam heat, there are available on the market quite a few motor-driven humidifiers for room use. There are also available a number of humidifiers for use with ordinary hot water or steam radiators, or for substitution in place of present steam or hot water radiators.

Many of these humidifying devices are compromises at best and as actually operated, their evaporating capacity may be very small. Also, many of them must be refilled with water by housewives, and this task is often neglected. It is believed, that fundamentally, the best type of humidifier is one which has plenty of evaporating capacity, does not throw free water out into the room, and does not depend upon the housewife for replacement of water.

While humidification, air cleaning, and circulation are still in the luxury class as far as application to homes is concerned, such devices are coming to be more and more recognized among domestic users as being desirable, and the demand for such equipment will undoubtedly increase.

Adding Refrigeration

The next step is, of course, to add cooling with refrigeration equipment to the home for use in summer. The average home may require about six tons of refrigeration roughly, for cooling in the hottest days in summer. This equipment is expensive, and used to full capacity only a few weeks in the year, so that it is expected that, until business conditions improve, cooling of the home with refrigeration will be of very limited demand.

In the case of air conditioning for profit, it will not be so necessary for business conditions to improve before a large demand exists, as users will be likely to install equipment if it will be profitable for them to do so, even in a depression era.

Large theaters and department stores have been among the pioneers of comfort cooling and air conditioning for profit. The cooling and air conditioning of theaters has shown large returns in a good many cases. For such installations, the refrigeration tonnages required are large. The average theater will require 0.07 tons of refrigeration to be installed per seat.

Theater Installations Elaborate

Such large installations invariably consist of elaborate duct systems for obtaining the proper air distribution. Humidification and dehumidification are obtained by means of water sprays. The horsepowers involved are quite large in a good many cases.

Considerable interest has been aroused within the last year or two in the air conditioning of railway passenger cars, and it is anticipated that this type of application will become increasingly popular in the near future. Many of the railroad officials feel that they can get back some of the passenger traffic lost to busses and automobiles by the cooling of their coaches, chair cars, observation cars, diners, and Pullman cars.

The installation of air-conditioning equipment on the passenger cars of one train very often forces the installation of similar equipment to the trains of competing railroads operating between the same two points.

There are three general types of railway car air-conditioning equipment now available, as follows:

1. Ice melting equipment.
2. Steam jet system.
3. Mechanical systems using compressors.

Ice Cooling Systems

The ice systems consist in general of compartments, heat insulated, located underneath the car, and in which large cakes of ice are stored. Water pumps are used to circulate the water over these cakes of ice, and to cooling coils located inside the car. Motor-driven fans are used to blow recirculated air in the car and also a certain percentage of outside air over these cooling coils and thus cool the car.

The ice-cooling systems have the advantages of low first cost as compared with the other systems, and large peak load capacity for cooling. On the other hand, operating cost is high due to the cost of the ice, and it is somewhat inconvenient and messy to load ice into the ice compartments on the car while the car is at the passenger station.

With the ice system, the standard 4.8-kw. axle generator and drive is usually considered as being of sufficient capacity to handle the pump and fan motors. While the standard 450-ampere-hour Pullman battery has been retained in some instances, in many cases a 600-ampere-hour battery has been substituted for the 450-ampere-hour size normally used.

In general, it is believed that the ice-melting equipment will soon be superseded by a steam and mechanical system, on account of the higher operating cost and inconvenience in load-

(*Concluded on Page 17, Column 1*)

Effects of Water Spray

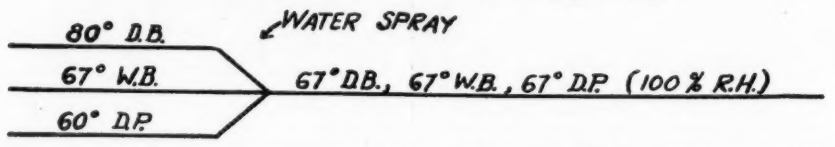

Fig. 1—Dry-bulb temperature of air passing through a spray of water which is continually recirculated will be reduced to the entering air's wet-bulb temperature by evaporative cooling.

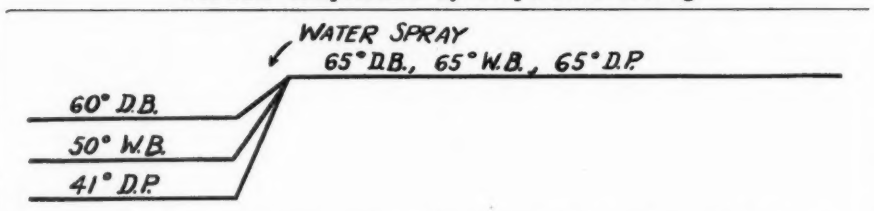

Fig. 2—If this same spray water were heated, the leaving wet-bulb temperature would be raised higher than the entering wet bulb temperature.

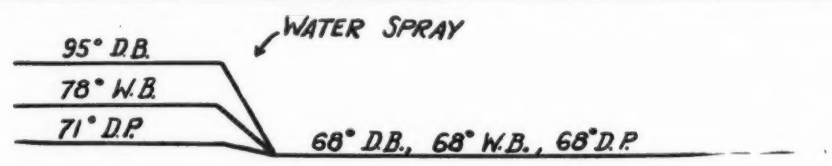

Fig. 3—By using spray water that is cooled sufficiently, the dew point can be lowered. Thus temperature of the spray controls the moisture in air leaving the spray.

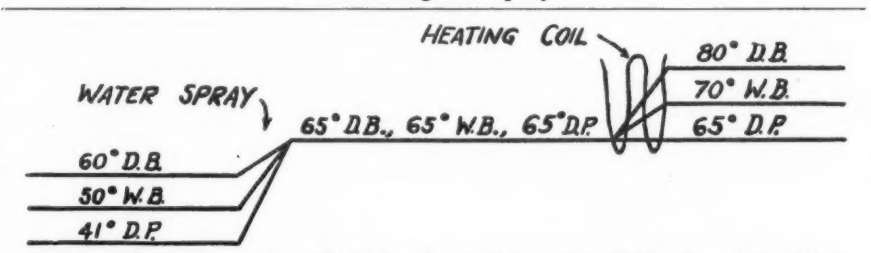

Fig. 4—Moisture can be added by the water spray, fixing the dew point; then heating coils are used to raise dry-bulb temperature to desired point.

*Paper presented before the Michigan Engineering Society, Lansing, Mich., Feb. 10, 1933.

A DEPENDABLE REFRIGERANT FOR AIR CONDITIONING EQUIPMENT

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The same uniformity, the same dependability that has been available to manufacturers of automatic refrigerators is available to makers of air conditioning equipment using sulphur dioxide as a refrigerant.

ANSUL CHEMICAL COMPANY
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Railroad Car Installations Require Accessible Units in Small Space

(*Continued from Page 16, Column 5*)

ing the ice. The steam ejector system utilizes steam from the locomotive boiler supplied through the train line.

The system consists in general of a steam ejector, an evaporator, a condenser, an air-cooling coil or air-conditioning unit, together with the necessary fans, pumps, regulating valves, etc. The steam ejector, which works on the jet principle, maintains a vacuum inside of the evaporator, which is a chamber through which water is being sprayed.

The water, being under a vacuum, boils, and part of it is evaporated. All of the latent heat of vaporization is obtained by cooling the vast bulk of water passing through the evaporator, only a few per cent being boiled away and carried out to the condenser by the ejector.

Operation of Steam Jet System

This cooled water is circulated through the air-conditioning unit in the car, the air-conditioning unit consisting of cooling coils through which the cold water is circulated, heating coils for heating in winter, fans, and other necessary auxiliaries.

The steam and evaporated water coming from the steam ejector is condensed in the condenser which is of the wetted surface type.

The steam jet system uses approximately nine kilowatts of generated capacity, two of the standard 4½-kw. axle-driven generators mounted underneath the car, being used. The installed battery capacity may be from 600-ampere hours to 1,000-ampere hours, depending upon conditions.

The 600-ampere-hour battery size is probably the most typical one used for the steam jet system. In some cases, a 7.5-kw. belt-driven axle generator has been substituted in place of the standard 4.5-kw. axle generator unit and used instead of two of the standard smaller sized axle generator units.

Safety Features of System

The steam ejector system has the advantage that it removes all possible question as to the safety of the refrigerant, the cost of operation is reasonable, and the draw-bar pull at the car coupling is less than for the mechanical system, since a smaller axle driven electric generating capacity can be used per car.

The disadvantages of the steam ejector system are that there are more pieces to install, requiring more labor and material for installation, a special hose must be used to maintain steam pressure in rear car of a long train, the water must be periodically replenished and precaution must be taken to avoid freezing. There is also the difficulty of maintaining proper steam pressure at the rear car so that the ejector can maintain sufficient vacuum.

Mechanical Systems Six Tons

A number of mechanical systems are available on the market. Since the refrigeration capacity required for the air conditioning of a railway car is usually about six tons, a compressor motor of 10 to 11 hp. size is usually required.

This means that a large size of axle driven generator must be used. For this application, there has been developed a gear-driven axle generator of approximately 15 kilowatts in rating. This generator has ample capacity to handle the power required to drive the compressor and fan comprising the air-conditioning system, and also to supply power for the car lighting system.

This large size of gear-driven axle generator replaces the present standard 4.8-kw. axle generator now usually used for car lighting. A 1,000-ampere-hour battery replaces the smaller battery used for car lighting only.

Axle Generator

The axle generator is separately excited from a direct-connected exciter, and the combination is arranged so that the polarity of the axle generator will be the same regardless of the direction of rotation, that is, whether the car is going forward or backward.

A vibrating type voltage regulator is used to maintain substantially constant voltage of the axle generator suitable for charging the 32-volt car lighting battery and for supplying power for the compressor motor and fan, at car speeds from 40 to 90 miles per hour.

The generator delivers 32 volts at approximately 26 miles per hour, and a reverse current relay is used to connect and disconnect the generator automatically from the battery circuit, depending upon the generator voltage, and car speed.

For railway applications, the air-conditioning system should be designed to occupy little or no floor space and to be of easy accessibility. The air-conditioning equipment proper, therefore, consists of an air-conditioning unit with the cooling coils for mounting in the car directly underneath the roof, and a refrigerating unit for mounting undearneath the car floor.

Two sizes of air-conditioning units are available. One size is rated at three tons cooling capacity, and two of these are used per car. One unit is mounted at each end of the car, and either the duct system or ductless system of air distribution may be used.

The other type of unit is rated at six tons of cooling capacity and is mounted at one end of the car directly underneath the roof, and is best used with a duct system.

The railway car air-conditioning units cool and dehumidify the air in summer. Dehumidification is obtained by condensation of moisture from the air on the cooling coils. Moisture falls off these cooling coils to a drain pan where it is drained off through a pipe connection.

Although the humidity in the car cannot be definitely regulated during the summer time with this arrangement, its dehumidifying effect is more or less automatic, since the greater the humidity of the air entering the unit, the greater will be the dehumidification taking place.

Heating and humidification for winter use, and also air filters, are provided for in the complete system as installed.

Ducts Favored for Railroad Cars

It is generally believed that the duct system of air distribution through a railway car is the most efficient and most applicable as regards comfort conditions within the car and desirability of proper air distribution. On the other hand, the cost of ducts adds considerable to the cost of installation of the system, so that many of the railroads prefer to use the ductless system for this reason.

The refrigerating unit for supplying liquid refrigerant to the cooling coils of the air-conditioning unit is designed for mounting underneath the car and consists of a compressor, electric driving unit, condenser fan of the propeller type, and air-cooled condenser, as well as various accessories such as liquid receiver, oil separator, etc.

Light-Weight Refrigerating Unit

A direct-connected compressor operating at 1,150 r.p.m. using low inertia valves has been developed for this application, to permit light weight compact design suitable for railway service.

The driving unit consists of a d.c. motor and an a.c. motor mounted in the same frame. While the car is on the road, the d.c. motor is used to drive the compressor, taking power either from the storage battery or from the axle generator, depending upon the car speed.

When the train is parked in the station, the a.c. motor can be used for driving the compressor for pre-cooling the car and also to drive the d.c. motor as a generator for charging the storage battery. The a.c. motor is readily connected to a 220-volt or 440-volt, three-phase power supply in the yard for this purpose, by means of a power plug receptacle.

Freon for Railway Work

Freon, the new refrigerant developed by General Motors and DuPont, is being used almost exclusively in railway car air-conditioning applications on account of the safety standpoint. The railroads are not very much in favor of using irritant refrigerants such as ammonia for this application on account of the trouble occurring in case leaks developed.

It is believed that small commercial installations of air-conditioning equipment will experience the greatest expansion, in addition to railway car air conditioning, in the field of air conditioning for profit, in the next few years.

If the installation of air-conditioning equipment can increase the patronage of small restaurants, barber shops, specialty shops, and similar businesses, there is no doubt but what such installations will be made and prove profitable.

Simplicity, Low Cost Desirable

For this class of application, low cost of equipment and installation is very desirable. Simplicity of operation and low maintenance are also essential since the people using such equipment will not be technically trained or be very well acquainted with mechanical equipment.

For this type of comfort cooling, surface cooling using finned tube evaporators or cooling coils, is well fitted. Either direct-expanded refrigerant or cooling water circulated by pumps may be used as a cooling means. If direct expansion is used, Freon or some other refrigerant equally safe should be used.

A complete air-conditioning installation of the type which we are discussing will consist of a number of unit air-conditioning equipments or room coolers located at suitable positions in the space to be cooled, and a refrigerating unit located in the basement or other convenient location for supplying refrigeration to the air-conditioning units.

The air-conditioning units include cooling coils for obtaining cooling and dehumidification in summer time, heating coils for heating in winter, humidifying equipment for humidifying in winter, and air filter, and a fan or blower for circulating air through the equipment and around the room.

An arrangement is made whereby air can be brought from the outside into the unit and mixed with recirculated air from the room, if desired, in order to place the inside of the room under a positive pressure so that unfiltered air will not get into the room, and so that a sufficient supply of outside air for maintaining comfort inside of the room will be available.

The equipment for such an installation must be selected very carefully. An estimate of the cooling and heating capacity required should be made, taking into consideration such effects as conduction through the walls and windows, heat given off by the people in the room, electric lights, sun load, air infiltration, and similar factors affecting the heat input or output to the room.

During the summer time, it has been found that the inside air should not be maintained more than about 15° F. below the temperature of the outside air, or people entering the room will experience a shock due to the sudden change in temperature.

Frequent practice is to figure about 15° cooling for installations such as small theaters or offices where the occupants will be present for long periods of time, and to figure only 10° F. cooling for small stores where there will be a number of customers present for only short periods of time. The cost of equipment is usually the deciding factor in determining the amount of cooling to be obtained.

No general rule can be given as to the capacities required, as conditions vary with the particular application in mind. However, in making very crude estimates or guesses, it is generally assumed that one ton of refrigeration capacity will handle from 250 to 350 sq. ft. of floor space.

Restaurants especially should be figured very closely in making estimates as to cooling capacities on account of the variability of the human load, and on account of air infiltration for ventilation. There have been cases known where cooling equipment has been installed in a restaurant to handle the heating effect of say 250 persons and then the management would complain that the cooling equipment was not of sufficient capacity.

An investigation showed that, although the manager had stated that his restaurant had a seating capacity of 250 persons when the first estimate was made, the installation of air-conditioning equipment so greatly increased his trade that he had later added enough tables and seats to seat 100 more people, thus adding more load than the cooling equipment could normally be expected to handle.

In general, it is believed that small commercial installations requiring up to 12 tons of refrigerating capacity can best be handled by using surface cooling equipment. From 12 tons up to possibly 25 tons of refrigerating capacity, the surface cooling equipment may or may not compete with a central duct system, using a water spray, depending upon the conditions of the application.

Above 25 tons, the central duct system is usually the most economical. These figures are not arbitrary, but they indicate roughly the fields to be considered as regards the application of surface type cooling units.

There are three types of small surface-type units available, each rated at 12,000 B.t.u.'s per hour cooling capacity. One model is suitable for use underneath a window, somewhat in appearance similar to a radiator concealed with a decorative cabinet. This model is particularly applicable to offices and homes.

Another model is particularly desirable for restaurants where a unit with a good appearance on all four sides is desirable. The third model of this particular size is arranged for ceiling mounting and is used in restaurants and stores where floor space is at a premium.

Larger sizes of air-conditioning units are available and are arranged so that they can be either suspended from the ceiling, mounted in ducts, or mounted above store windows. Most stores and restaurants have the display windows in the front, with a platform above the display window, at a height of about eight or nine feet above the floor.

KASON'S GREATEST CONTRIBUTION TO MODERN REFRIGERATION

Illustrated Actual Size

K-40A A NEW KASON LATCH

Remarkably Improved

A new, ingenious Micrometer Strike (pictured and described below) and the rugged strength of a new FORGED BRASS construction are two added features of the new improved line of Kason Refrigerator Latches. The K-40A Latch pictured above is the popular size for refrigerator and meat display cases. Three other sizes of matched design are available for every refrigerator need. Samples will be cheerfully sent on approval.

✓CHECK THESE FEATURES

RUGGED STRENGTH: Constructed of the hardiest metals known to the industry. Lock is constructed of forged brass throughout. Strike and tongue are made of Parkerized tool steel.

HAIRLINE OFFSET ADJUSTMENTS are easily made on the new patented strike. See illustration alongside.

SEALS AS IT LOCKS: The slanting tongue acts as a wedge which automatically penetrates deep into the strike to take up normal play of the door.

SIMPLICITY: Yank it open—slam it shut.

BEAUTY: The beauty of the modernistic lines of this lock is enhanced by perfect fiinish.

GUARANTEED: Defective or broken parts will be replaced free of cost for THREE YEARS.

THE NEW PATENTED STRIKE

Showing the Micrometer Adjustment for Various Offsets

A turn of the screw raises or lowers the strike in its socket. Perfect alignment of the strike and lock to the thousandth of an inch is thus assured throughout the long life of this latch—an assurance of perfect insulation.

KASON HARDWARE CORPN.
61-67 Navy Street Brooklyn, N.Y.

A COMPLETE NEW LINE OF FORGED-BRASS HARDWARE
INGENIOUSLY IMPROVED – MASTERFULLY DESIGNED

PATENTS

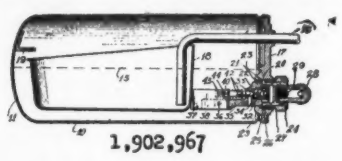
ISSUED MARCH 28, 1933

1,902,818. AIR CONDITIONING CONTROL. Samuel M. Anderson, Sharon, Mass., assignor to B. F. Sturtevant Co., Boston, Mass., a Company. Filed Sept. 10, 1930. Serial No. 481,012. 16 Claims. (Cl. 261—13.)

1. An air conditioning system comprising a ventilating unit, a heater unit, a spray chamber, and means responsive to the temperature of the water returned from said spray chamber for controlling the temperature of said heater unit.

1,902,967. FLOAT VALVE STRUCTURE. Harold Roy McPhail, Detroit, Mich., assignor to Norge Corp., Detroit, Mich., a Corporation of Michigan. Filed Feb. 17, 1930. Serial No. 428,877. 5 Claims. (Cl. 137—104.)

3. An evaporator header tank for refrigerating apparatus, comprising a float chamber closed at one end, a head sealingly engaging the other end thereof, a shouldered float valve body projecting inwardly through a shouldered aperture in said head, the shoulders on the body and in the aperture serving to locate said valve body, a retaining member abutting against said valve body, an external packing gland for clamping said retainer member and valve body shoulder against the aperture shoulder, a valve seat aligned with a valve guide aperture in said valve body, a valve stem engaging in one position against said seat, and float mechanism for actuating said valve stem.



1,902,967

1,903,137. AIR CONDITIONING APPARATUS. Louis P. Reiss, Dallas, Tex. Filed June 11, 1931. Serial No. 543,574. 7 Claims. (Cl. 261—90.)

1. An air conditioning machine including a housing, a fluid reservoir and a superimposed fluid receptacle, a shaft, means carried by said shaft for transferring fluid from said reservoir to said receptacle in a continuous circular stream, a diffusing disc also carried by said shaft, means for continuously feeding fluid by gravity to said diffusing disc during rotation of said shaft, a fan carried by said shaft and means disposed between said fan and said fluid transferring means for separating moisture from the air currents during their passage through said machine.

1,903,167. PRESSURE VESSEL FOR SOLID CARBON DIOXIDE. Almon J. Cordrey, Detroit, Mich, assignor to Zero Ice Corp., a Corporation of Michigan. Filed March 12, 1931. Serial No. 522,112. 5 Claims. (Cl. 62—91.5.)

1. A pressure vessel for liquefying solid carbon dioxide, comprising an elongated hollow body having an end charging opening of lesser size than the interior of the body, and a rack in said vessel of substantially greater length than width, the width of said rack being greater than the size of said opening whereby it cannot be removed from said pressure vessel without deformation.

1,903,168. PRESSURE VESSEL FOR SOLID CARBON DIOXIDE. Almon J. Cordrey, Detroit, Mich., assignor to Zero Ice Corp., a Corporation of Michigan. Filed March 20, 1931. Serial No. 524,171. 6 Claims. (Cl. 220—24.)

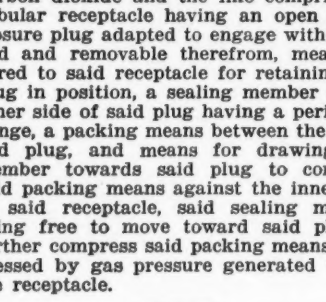
1. A pressure vessel for liquifying solid carbon dioxide and the like comprising a tubular receptacle having an open end, a closure plug adapted to engage within said end and removable therefrom, means secured to said receptacle for retaining said plug in position, a sealing member on the inner side of said plug having a peripheral flange, a packing means between the flange and plug, and means for drawing said member towards said plug to compress said packing means against the inner wall of said receptacle, said sealing member being free to move toward said plug to further compress said packing means when pressed by gas pressure generated within the receptacle.

1,903,169. INSULATED CONTAINER FOR SOLID CARBON DIOXIDE. Almon J. Cordrey, Detroit, Mich., assignor to Zero Ice Corp., a Corporation of Michigan. Filed April 16, 1931. Serial No. 530,622. 4 Claims. (Cl. 220—9.)

1. An insulated receptacle for a substance vaporizable by heat, comprising a side wall having inner and outer gas tight faces, the inner face being perforated at the top to permit passage of gas from within the receptacle into the intervening wall space, porous insulation in said intervening space, and a sheet-like baffle extending downward from the top edge of said wall and terminating above the lower edge thereof, said baffle dividing the insulation into layers communicating at their lower edges, and perforations in the outer wall face to permit escape of gas from said intervening space.

1,903,170. SOLID-CO_2 REFRIGERATING SYSTEM. Almon J. Cordrey, Detroit, Mich., assignor to Zero Ice Corp., a Corporation of Michigan. Filed Dec. 21, 1931. Serial No. 582,410. 21 Claims. (Cl. 62—91.5.)

1. A method of refrigeration comprising circulating a low-freezing liquid refrigerant in heat transfer relation with a space



1,903,170

to be cooled, submerging solid CO_2 in a portion of said refrigerant to produce the cooling effect desired, and controlling the temperature of the refrigerant by the effective exposure of the solid-CO_2 to said refrigerant.

1,903,171. SOLID CO_2 RECEPTACLE. Almon J. Cordrey, Detroit, Mich., assignor to Zero Ice Corp., a Corporation of Michigan. Filed Jan. 7, 1932. Serial No. 585,352. 9 Claims. (Cl. 62—91.5.)

1. An insulated receptacle for a substance vaporizable into a gas denser than air, having a removable closure and comprising side walls having inner and outer gas tight faces oppositely perforated near the top to permit the passage of gas freely into and out of the entire intervening wall space, thereby displacing less dense gases from the wall space and permitting convection circulation of the gas within the side wall space.

1,903,210. SEALING AND THRUST BALANCING MEANS. Willis H. Carrier, Essex Fells, N. J., assignor to Carrier Engineering Corp., Newark, N. J. Filed Feb. 28, 1929. Serial No. 343,398. 4 Claims. (Cl. 296—9.)

1. The combination with a rotary shaft and a casing having a shaft opening through which said shaft extends, of means for sealing said shaft opening comprising a sealing member rotatable with said shaft, a sealing chamber in which said sealing member rotates and at one end of which is an opposing seat for said sealing member, an annular piston movable axially in said sealing chamber and engaging said sealing member, said piston fitting closely in said sealing chamber and having a portion closely surrounding said shaft at the opposite end of said sealing member from said seat, and means for admitting to the sealing chamber liquid under pressure which acts on said piston to move and hold said sealing member out of contact with said seat and maintains liquid under pressure in said sealing chamber and in the interior of said piston to provide a seal for said shaft opening.

1,903,250. AIR CONDITIONING APPARATUS. Dwight Tenney, Montclair, N. J. Filed Nov. 11, 1930. Serial No. 494,841. 6 Claims. (Cl. 257—8.)

1. Apparatus for maintaining the air of a chamber at a predetremined temperature which comprises heat-delivery means located along the walls of the chamber, said heat-delivery means being of sufficient capacity to supply a major portion of the required heat, insulating shields disposed on the chamber side of the heat-delivery means, an air conditioning duct through which air from the chamber is circulated, auxiliary heating means for supplying the remainder of the required heat to the air passing through the conditioning duct, and a thermostat disposed to automatically control the auxiliary heating according to the temperature of the main body of air of the chamber.

Kason Introduces New Brass Hardware

BROOKLYN—A new line of forged brass refrigerator hardware is being introduced by Kason Hardware Corp. here. The new products include a series of four latches, and ball-bearing hinges.

Kason engineers claim the following average physical properties for the new hardware: tensile strength, 57,000 lbs. per sq. in.; elastic limit, 30,000 lbs. per sq. in.; Brinnell hardness, 110; and elongation in 2 in., 25 per cent.

12 Manufacturers Sell 30,422 Household Electric Refrigerators During February, 1933

Reported by Refrigeration Division of National Electrical Manufacturers Association. Member companies: Copeland, Crosley, Frigidaire, General Electric, Gibson, Grigsby-Grunow, Kelvinator, Norge, Servel, Trupar, Universal Cooler, and Westinghouse.

	World Sales		U. S. A. INVENTORIES: Factory, Branch, and Warehouse		Dealers and Distributors	
HOUSEHOLD	Quantity	Dollars	Quantity	Dollars	Quantity	Dollars
Lacquer (Ext.) Cabinets with Systems						
1. Under 4.00 cubic feet	631	24,928	1,446	76,685	1,293	69,540
2. 4 to 4.99 cubic feet	7,344	461,680	21,980	1,614,440	15,276	1,102,960
3. 5 to 5.99 cubic feet	2,302	160,492	8,783	659,895	6,271	484,197
4. 6 to 6.99 cubic feet	4,608	378,720	23,417	2,516,142	11,962	1,172,727
5. 7 to 7.99 cubic feet	3,014	239,499	9,590	863,782	4,878	459,914
6. 8 to 9.99 cubic feet	1,628	152,790	3,544	560,763	2,996	386,929
7. 10 to 12.99 cubic feet	32	6,698	2,042	408,573	633	127,280
8. 13 to 16.99 cubic feet	5	1,369	454	109,788	118	29,352
9. 17 to 24.00 cubic feet	.....	.....	250	71,906	79	23,313
10. Total Lacquer	**19,564**	**1,426,176**	**71,506**	**6,881,974**	**43,506**	**3,856,212**
Porcelain (Ext.) Cabinets with Systems						
11. Under 4.00 cubic feet	196	11,768	804	42,192	527	26,961
12. 4 to 4.99 cubic feet	1,550	120,104	4,501	353,630	2,679	197,836
13. 5 to 5.99 cubic feet	1,952	164,540	2,008	176,972	2,922	267,318
14. 6 to 6.99 cubic feet	3,077	306,470	4,531	524,943	2,852	313,560
15. 7 to 7.99 cubic feet	2,415	276,065	2,939	358,926	2,849	349,817
16. 8 to 9.99 cubic feet	459	65,985	1,007	160,128	2,094	324,424
17. 10 to 12.99 cubic feet	521	75,545	1,947	337,389	923	178,097
18. 13 to 16.99 cubic feet	88	18,151	2,472	511,300	356	72,328
19. 17 to 24.00 cubic feet	22	7,145	1,192	355,785	233	70,319
20. Total Porcelain	**10,280**	**1,045,773**	**21,401**	**2,821,265**	**15,435**	**1,800,660**
21. Total Lines 10 and 20	**29,844**	**2,471,949**	**92,907**	**9,703,239**	**58,941**	**5,656,872**
22. Separate Systems	141	6,137	6,714	390,114	335	16,511
23. Separate Household Low Sides	437	6,540	4,127	74,924	818	16,793
24. Total Lines 21, 22, and 23	**30,422**		**103,748**	.....	**60,094**	.....
25. High Sides Under 1/3 hp.	484	19,544	3,849	192,379	517	23,632
26. Cabinets—No Systems	372	15,475	52,205	2,118,109	179	19,968
27.	.....	.....	.....	.....	.....	.....
28. Totals Household	.....	**2,519,645**	.....	**12,478,765**	.....	**5,733,776**
COMMERCIAL						
31. Water Coolers with High Sides	409	42,982	11,714	1,248,976	3,027	330,751
32. Water Coolers with No High Sides	35	1,814	878	44,888	168	8,156
33. Ice Cream Cabinets with High Sides	201	22,257	3,556	440,692	107	12,495
34. Ice Cream Cabinets with No High Sides	273	32,072	4,803	566,862	234	15,810
35. Milk Coolers with No High Sides	.....	.....	8	1,503	60	10,188
36. Room Coolers with High Sides	.....	.....	3	1,568	1	523
37. Room Coolers with No High Sides	41	3,262	2,730	249,780	182	18,105
38. Extra High Sides, 1/3 hp. and Up	2,525	239,297	11,764	1,349,854	3,322	414,713
39. Total Lines 31, 33, 36, and 38	**3,135**	.....	**27,037**	.....	**6,457**	.....
40. Extra Commercial Low Sides	3,398	91,343	16,099	485,359	4,842	151,422
41. Miscellaneous Cases and Cabinets	16	3,624	.....	330,704	.....	129,772
42.	.....	.....	.....	.....	.....	.....
43. Totals Commercial	.....	**436,651**	.....	**4,720,186**	.....	**1,091,935**
44. Totals—Household and Commercial	.....	**2,956,296**	.....	***17,308,951**	.....	****6,825,711**

*The total of the figures by sizes and kinds does not agree with the total figure shown, namely $17,308,951 because of the failure to supply the detailed information by all companies.
The number of companies reporting inventories at factory, branches, and warehouses was 10. The percentage of total sales of these 10 companies was 95.7.
**The number of companies reporting inventories of dealers and distributors was 9. The percentage of total sales of these 9 companies was 82.3.

Sales By States, February, 1933

STATES and Territories	Quantity of HOUSEHOLD Low Sides
Connecticut	460
Maine	186
Massachusetts	1,332
New Hampshire	82
Rhode Island	143
Vermont	86
New England Total	**2,289**
Delaware	80
Maryland & D. C.	1,381
New Jersey	1,076
New York (State)	5,884
Pennsylvania	2,267
Eastern Total	**10,688**
Kentucky	439
Ohio	1,607
West Virginia	353
East Central Total	**2,399**
Alabama	241
Florida	202
Georgia	360
North Carolina	211
South Carolina	94
Tennessee	226
Virginia	513
Southeastern Total	**1,847**
Illinois	1,772
Indiana	589
Michigan	485
Wisconsin	318
Great Lakes Total	**3,164**
Minnesota	587
North Dakota	36
South Dakota	107
North Central Total	**730**
Iowa	327
Kansas	472
Missouri	1,510
Nebraska	180
Middle West Total	**2,489**
Arizona	114
California	1,508
Nevada	14
Pacific Coast Total	**1,636**
Idaho	20
Montana	53
Oregon	92
Utah	28
Washington	360
Northwestern Total	**553**
Colorado	224
New Mexico	53
Wyoming	14
Rocky Mountain Total	**291**
Arkansas	126
Louisiana	269
Mississippi	85
Oklahoma	449
Texas	1,300
Southwestern Total	**2,229**
Total United States	**28,315**
Total Canada	359
Other Foreign (Including U. S. Possessions)	1,643
Total for World	**30,317**

G. E. SUES TAGLIABUE ON SWITCH MECHANISM

NEW YORK CITY—Suit against the C. J. Tagliabue Mfg. Co., manufacturer of Tag refrigeration controls, was filed by General Electric Co. on March 17, claiming infringement of letters patent No. 1,683,132 granted on Sept. 4, 1928, to Chester I. Hall and subsequently assigned to the General Electric Co. The suit was brought in the U. S. district court, Eastern District of New York.

The patent pertains to a snap-action tumbler switch mechanism with an overload protective device consisting of a bi-metallic element which is warmed, by high currents passing through a small heating coil, to release the switch.

ALCO THERMO VALVE

METHYL CHLORIDE - F-12
SULPHUR-DIOXIDE

A NEW thermostatic valve—*that can be installed in any position or location—and in any temperature*—the control always resides in the thermal bulb—even if the body of the valve is subjected to a lower temperature.

Write for Bulletin No. 129

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Type NR

BEER
COOLING EQUIPMENT

for every type installation. Mohawk Dry Type Coils and Submerged Type Coils, Storage Coolers and Bottle Dispensing Coolers. Same high efficiency as characterizes Mohawk Domestic Equipment. Prices and discounts are right!

MOHAWK REFRIGERATION

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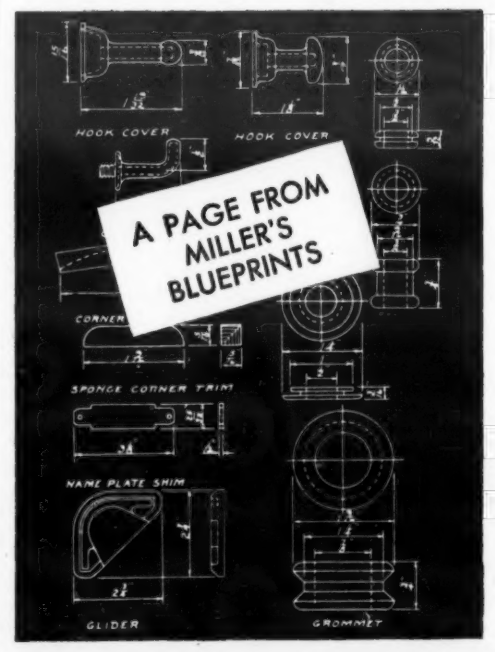
Rudolph Wurlitzer Manufacturing Company,
North Tonawanda, New York

Please send complete information on Mohawk Beer Cooling Equipment.

Name_____

Address_____

"Miller Knows Rubber"



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SINCE this electrical refrigeration industry was in the blueprint stage Miller has tackled and solved its rubber problems.

Filling exacting requirements is our daily routine. A technical staff experienced in refrigeration divides among its members responsibility for rubber accessories of practically every leading make of refrigerator. *It observes scrupulous professional respect for confidential data.*

Doorseal compounds which eliminate odor, avoid checking and cracking, retain their "spring" and reduce the deteriorating action of butter, grease and mayonnaise to a minimum—these are important details which Miller solves. Our standard blueprints cannot fail to interest and help the production engineer. This specialized service is yours for the asking. Just write—

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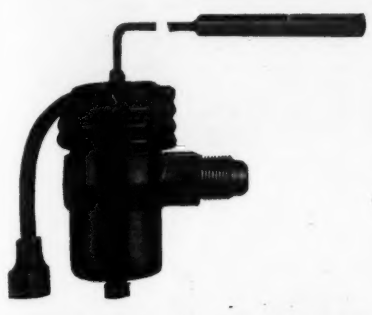

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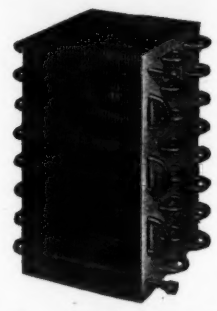
For use with Methyl Chloride and Sulphur Dioxide

The perfect thermostatic valve. The control always resides in the bulb due to the patented Peerless warming method. The PEERLESS will eliminate your expansion valve troubles.

List Price, $13.50. Write for bulletin.

PEERLESS ICE MACHINE CO., 515 W. 35th St., Chicago, Ill.

A NEW FIN COIL *by* PEERLESS



Wedge-locked and edge-locked aluminum fins on tinned copper tubing for methyl chloride, sulphur dioxide, F-12, etc.,—aluminum tubing for ammonia.

Absolute Metal to Metal Contact.

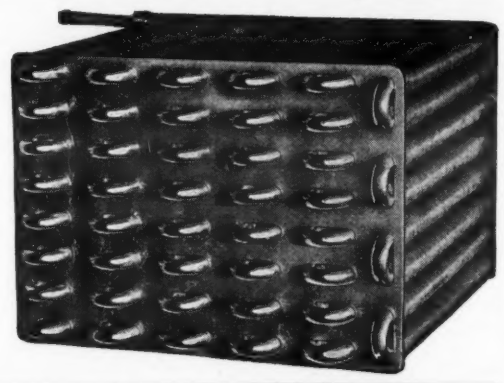
A Superior Coil in which Soldered Return Bends have been eliminated.

Priced to meet 1933 conditions.

Write—Wire for Catalog.

PEERLESS ICE MACHINE CO., 515 W. 35 h St., Chicago, Ill.

ROME EVAPORATORS



Highest Efficiency
With Smallest Number of Joints

Rome-Turney Radiator Co.
Rome, N.Y.

Makers of Rome Condensers and Helical Finned Tubing

REFRIGERATION SUPPLIES

MELCO BRAND

Save money, time and work—
Buy everything from one source

We carry a complete stock of
EVERYTHING IN REFRIGERATION
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MELCO BRAND

BEER COOLING EQUIPMENT

MELCHIOR, ARMSTRONG, DESSAU CO.

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Hercules had nothing on you

With a Balance Truck you can handle refrigerators, heavy boxes, stoves, crates, etc., with ease. The truck carries the load with no strain on your arms. The padded nose piece has instant, exact adjustment. Write today for details.

We also manufacture the Caster X-70 Refrigerator Trucks

Self-Lifting Piano Truck Co.
Findlay, Ohio
Manufacturers of Trucks for 33 Years

EXTRA HEAVY FORGED FLARE NUTS

¼"—3.30 per c ⅜"—4.50 per c ½"—5.80 per c
For Mixed Lots of 100 Add 5 Per Cent

COPPER REFRIGERATION TUBING
20′ — 50′ — 100′ Lengths

Size	Length Per Lb.	1 to 24 Lb.	Price Per Ft.	25 to 49 Lbs.	Price Per Ft.
¼"	11 ft.	34 c	3¼c	28	2¾
⅜"	7 ft.	33 c	5c	27	4
½"	5 ft.	32 c	6½c	26	5¼

REFRIGERATION OIL
$1.50 per Gallon
Free From Moisture—Sludge—Acid

REFRIGERATION GASES
Ammonia, Carbon Dioxide, Ethyl Chloride, Isobutane, Methyl Chloride, Sulphur Dioxide.

All Other Sizes Available. All Prices Subject to Change Without Notice.

ICELESS REFRIGERATION ACCESSORIES COMPANY
2401-15 Chestnut Street Philadelphia, Penna.

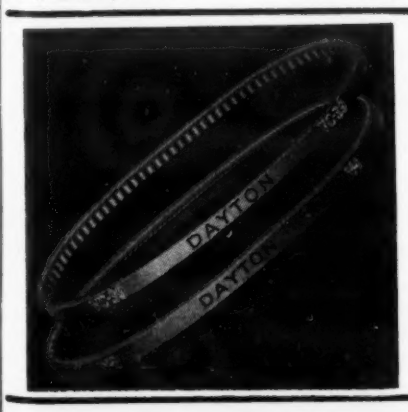
KRAMER REFRIGERATION PRODUCTS

ALL-COPPER COMMERCIAL EVAPORATORS
"Hot-Dip" thermal bond between every fin and every tube

DOMESTIC EVAPORATORS
In 2, 3, 4 and 5 tray sizes with Chrome or Porcelain Cover Plates

CONDENSERS for HIGH SIDES

TRENTON AUTO RADIATOR WORKS
241 W. 68th St. New York, N.Y. | TRENTON, NEW JERSEY | 5145 Liberty Ave. Pittsburgh, Pa.



Dayton V-Belts

For all makes and types of refrigerators. There is a stock near you. Ask for price list and name of your nearest distributor.

THE DAYTON RUBBER MFG. CO.
Dayton, Ohio
The World's Largest Manufacturer of V-Belts

QUESTIONS

Thermometers for Premiums

No. 1135 (Distributor, New York)—"We are interested in purchasing a quantity of refrigerator thermometers to be given away. We would appreciate your advising by return mail where we might obtain various low-priced thermometers."

Answer—Try Taylor Bros. Co., Rochester, N. Y.

Compressor Seals

No. 1136 (Distributor, Illinois)—"Will you please advise me names of manufacturers of sylphon seals to keep refrigerant gas from leaking from around the crankshaft of small commercial ice machines."

Answer — Bridgeport Brass Co., Bridgeport, Conn.; Clifford Mfg. Co., 564 E. First St., Boston, Mass.; Fulton Sylphon Co., Knoxville, Tenn.; Mueller Brass Co., 1925 Lapeer Ave., Port Huron, Mich.; and Rotary Seal Co., 809 W. Madison St., Chicago, Ill.

Refrigeration Training Schools

No. 1137 (Buffalo)—"Please advise me which schools teach electric refrigeration. Servel Sales Corp. suggested that I write to you for information, as I tried to enter their factory school, and was advised that they accommodate only service men from their own dealers and distributors."

Answer—Inquire at Seneca Vocational High School in your city.

Length of Guarantees

No. 1138 (Distributor, Hawaii)—"During the past several months there has been a great change in the length of guarantees extended by the various electric refrigerator manufacturers. Please advise if a list of manufacturers, with the guarantees offered, is available from your house."

Answer — This information was given in the "Specifications Issue" of ELECTRIC REFRIGERATION NEWS, March 22.

Air-Cooled Condensers

No. 1139—"Where can I buy air-cooled condensers for refrigerating machines up to one horsepower?"

Answer—Get in touch with manufacturers listed on pages 216 and 217 of the REFRIGERATION DIRECTORY.

Repossessed Electric Refrigerators

No. 1140 (Distributor, Arkansas)—"Will you kindly give us any available information on wholesale dealers in used and repossessed electric refrigerators. We are contemplating opening up a second-hand refrigeration business in our city, and will appreciate a list of companies which deal in this class of merchandise."

Beer-Cooling Equipment

No. 1141—"Can you furnish a list of companies making beer-cooling equipment similar to that of Fedders Mfg. Co., Buffalo, N. Y."

Answer—Brunswick-Balke-Collender Co., 623 S. Wabash Ave., Chicago, Ill.; Bishop & Babcock Sales Co., 4901 Hamilton Ave., Cleveland, Ohio; Commercial Coil & Refrigeration Co., 455 N. Artesian Ave., Chicago, Ill.; Commercial Refrigerator Mfg. Co., 1020 E. 59th St., Los Angeles, Calif.; Consolidated Equipment Sales Co., Grand Rapids, Mich.; Esco Cabinet Co., 140 E. Market St., West Chester, Pa.; Fedders Mfg. Co., 57 Tonawanda St., Buffalo, N. Y.; Filtrine Mfg. Co., 53 Lexington Ave., Brooklyn, N. Y.; Frantz Refrigeration Co., Reading, Pa.; Frigidaire Corp., Dayton, Ohio; Kelvinator Corp., 14250 Plymouth Rd., Detroit, Mich.; Liquid Carbonic Co., 3100 S. Kedzie Ave., Chicago, Ill.; Liquid Cooler Corp., 1349 E. Milwaukee Ave., Detroit, Mich.; McCray Refrigerator Sales Corp., Kendallville, Ind.; and Russ Mfg. Co., 5700 Walworth Ave., Cleveland, Ohio.

Condensers and Receivers

No. 1142 (Service company, Iowa)—"Please send us names of several manufacturers of condensers, receivers, and evaporators for domestic and commercial refrigerators."

Answer—Makers of these products are listed in the REFRIGERATION DIRECTORY.

Figuring Machine Capacities

No. 1143 (Manufacturer, Rhode Island)—"Referring to your sheet describing 'Conditions for Determining Condensing Unit Capacities' enclosed with your questionnaire on specifications, please advise us which is the approved method of determining the pounds of ice melting capacity. You state the conditions for determining the ice melting effect, but do not state the method of making the determination.

"Is this done by measuring the amount of refrigerant condensed per hour, or by maintaining some sort of heat balance arrangement? Some special method would have to be devised to measure the amount of refrigerant condensed by sealed systems."

Answer—It is generally agreed that the calorimetric method is most accurate for measuring the refrigerating effect of a system, but due to the fact that many manufacturers have not invested in the costly calorimeter apparatus for this purpose, we do not attempt to specify equipment for making this determination. This arrangement employs a calorimeter in which a heat balance is established between the refrigerating system and electrical resistance heaters, the energy input to the heaters indicating the refrigerating output of the machine under test.

Other manufacturers use another method which is quite accurate—that of measuring the amount of refrigerant liquified in a given period of time. Still others simply make a mathematical calculation based on the bore, stroke, and speed of the compressor, refrigerant characteristics, etc.

Crosley Icy-Ball

No. 1144 (Spain)—"We will appreciate your advice as to the name and address of the company manufacturing 'Icy-Ball' portable refrigerating units."

Answer—Crosley Radio Corp., Cincinnati, Ohio.

Cabinet Manufacturers

No. 1145 (Manufacturer, Illinois)—"Kindly let us know where we can obtain a list of the manufacturers of refrigerator cabinets or cooling cases."

Answer — REFRIGERATION DIRECTORY and MARKET DATA BOOK.

Specifications

No. 1146—"Can you furnish the following information on the 10 or 15 leading makes of refrigerators: model number, gross cubic content, net cubic content, shelf area, features, and price, f.o.b. factory or delivered? I am interested in models having eight or less cubic feet capacity, in both leader models and standard lines."

Answer—This information, together with other pertinent facts about 35 makes of refrigerators, was featured in the "Specifications Issue" of ELECTRIC REFRIGERATION NEWS, March 22. Extra copies are available at 10 cents each.

For Cleaning Beer Coils

No. 1147 (Plumber, Ohio)—"In connection with the description of Temprite beer coolers on page 9 of the March 29 issue of ELECTRIC REFRIGERATION NEWS, mention is made of an alkaline cleaning compound manufactured by the Valley Chemical Co. for cleaning and sweetening beer coils. Please let us have the address of this company, as we are having inquiries for such a cleaning compound."

Answer—The Valley Chemical Co., Newark, N. J.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912.

Of Electric Refrigeration News, published weekly at Detroit, Michigan, for April 1, 1933.

STATE OF MICHIGAN,
COUNTY OF WAYNE—ss.

Before me, a Notary in and for the State and county aforesaid, personally appeared Geo. N. Congdon, who, having been duly sworn according to law, deposes and says that he is the Business Manager of the Electric Refrigeration News, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:
Publisher, F. M. Cockrell, Detroit, Mich.
Editor, George F. Taubeneck, Detroit, Mich.
Business Manager, Geo. N. Congdon, Detroit, Mich.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)
Business News Publishing Co., Detroit, Mich.
F. M. Cockrell, Detroit, Mich.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)
None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fire owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is ..... (This information is required from daily publications only.)

GEO. N. CONGDON,
Business manager.

Sworn to and subscribed before me this 30th day of March, 1933.
(SEAL) HAROLD V. STARK.
(My commission expires Sept. 19, 1934.)

CLASSIFIED

PAYMENT in advance is required for advertising in this column.

RATES: Fifty words or less, one insertion $2.00, additional words four cents each. Three insertions $5.00, additional words ten cents each.

POSITIONS AVAILABLE

WANTED: Representatives for our thermostat repair service. Protected territory available as side line for men now calling on domestic refrigeration service trade. Liberal commissions, no outlay. Halectric Laboratory, 1793 Lakeview Road, Cleveland, Ohio.

POSITIONS WANTED

IF YOU need an aggressive engineer with successful record designing hermetic and seal type refrigerators, who can handle your electrical, mechanical and refrigeration work in an executive or design capacity in both the domestic and commercial fields, and you expect to put over a real program write Box 558, Electric Refrigeration News.

EQUIPMENT WANTED

CAN USE Servel and Copeland commercial units ½ to 3 H. P. Also Larkin coils in any quantity new or used. Will take immediately and pay cash. Give full details and price in first letter. Box 555.

MISCELLANEOUS

"INDIRECT SELLING." Six months of research in the field by men who hold executive positions proves that refrigerators and appliances can be sold without canvassing. Send for book covering plan. Fits Specialty Stores, Department and Furniture Stores or Public Utilities. If plan is unsound and does not meet with approval of majority of your salesmen, money will be refunded. Price One Dollar. Send money order or check. R. V. Mealey, 54 East Sixth St., St. Paul, Minn.

SEND one dollar in cash, stamps, or P.O. money order for 17 week's trial subscription to Electric Refrigeration News and keep informed regarding important developments in the industry during the active selling season.

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